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EDITED BY

THOMAS L. STEDMAN, M.D.

NEW YORK CITY

IN TWENTY VOLUMES

VOLUME V

DISEASES OF THE SKIN

NEW YORK

WILLIAM WOOD AND COMPANY

1896

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CONTENTS.

	PAGE
ANATOMY OF THE SKIN AND ITS APPENDAGES,	1
The Skin,	3
Glandular Structures,	11
Vascular System,	13
Muscles,	15
Pigmentation,	15
Nerves,	16
Hair,	17
Nails,	20
Bibliography,	21
PARASITIC DISEASES,	27
Animal Parasitic Diseases,	29
Pediculosis,	29
Cimex Lectularius,	37
Pulex Irritans,	38
Ixodes,	39
Dermanyssus Avium and Gallinæ,	40
Culicidæ, Simulidæ, and Tabanidæ,	41
Apes, Vespidæ, Araneina, etc.,	41
Hirudo,	42
Scabies,	42
Leptus Autumnalis,	50
Pulex Penetrans,	52
Demodex Folliculorum,	53
Dracunculus Medinensis,	54
Filaria Sanguinis Hominis,	56
Craw-craw,	57
Cysticercus Cellulosæ,	58
Echinococcus Cutis,	59
Distoma Hepaticum,	59
Bilharzia Hæmatobia,	60
Œstridæ,	60
Muscidæ,	63
Bibliography,	64
Vegetable Parasitic Diseases,	64
Tinea Trichophytina,	66
Tinea Imbricata,	96
Tinea Versicolor,	97
Tinea Favosa,	102
Erythrasma,	112

PAGE
Myringomycosis, ... 113
Vaginomycosis, ... 115
Labiomycosis, ... 116
Pinta Disease, ... 116
Actinomycosis of the Skin, ... 117
Mycetoma, ... 119
Alopecia Areata (some forms), ... 120
Bibliography, ... 121
Microparasitic Diseases, ... 121
Bibliography, ... 124
ERYTHEMATOUS AFFECTIONS, ... 125
Hyperæmic Erythema, ... 128
E. Traumaticum, ... 130
E. Caloricum, ... 131
E. Intertrigo, ... 132
E. Læve, ... 135
E. Pudicitiæ, Iracundiæ, ... 135
E. Roseola, ... 135
E. Scarlatiniforme, ... 136
Inflammatory Erythema, ... 143
E. Pernio, ... 144
E. Exudativum Multiforme, ... 145
E. Nodosum, ... 156
E. Induratum, ... 160
Peliosis Rheumatica, ... 161
Bibliographical References, ... 165
ECZEMA AND DERMATITIS, ... 167
Eczema, ... 169
E. Erythematosum, ... 174
E. Papulosum, ... 175
E. Vesiculosum, ... 176
E. Pustulosum, ... 177
E. Squamosum, ... 178
E. Seborrhœicum, ... 178
E. Rubrum or Madidans, ... 179
E. Parasiticum, ... 180
E. Marginatum, ... 181
E. Neuroticum or Neuriticum, ... 181
E. Diabeticorum, ... 182
E. Intertrigo, ... 182
E. Fissum (Rhagadiforme), ... 183
E. Verrucosum, ... 183
E. Sclerosum, ... 183
Acute Eczema, ... 183
Chronic Eczema, ... 184
E. Infantile, ... 185
Treatment, ... 192
E. of the Scalp, ... 205
E. of the Face, ... 207
E. of the Ears, ... 209
E. of the Lids, ... 210

PAGE
E. of the Nostrils, ... 210
E. of the Lips, ... 212
E. of the Region of the Beard, ... 213
E. of the Genital Region, ... 213
E. of the Anus and Anal Region, ... 216
E. of the Extremities, ... 218
E. of the Hands and Feet, ... 221
E. of the Nails, ... 224
E. of the Nipples and Breasts, ... 224
E. Intertrigo, ... 226
E. of the Umbilicus, ... 227
E. Parasiticum, E. Marginatum, ... 227
E. Seborrhœicum, ... 228
E. of the Tropics, ... 229
Universal Eczema, ... 229
E. in Infants, ... 230
Dermatitis, ... 232
D. Traumatica, ... 232
D. Venenata, ... 232
D. Medicamentosa, ... 235
D. Calorica, ... 243
Feigned Diseases of the Skin, ... 252
D. Repens, ... 255
D. Exfoliativa Epidemica, ... 257
Bibliography, ... 258
SQUAMOUS AFFECTIONS, ... 263
Psoriasis, ... 265
Bibliography, ... 279
Pityriasis Rubra, ... 280
Bibliography, ... 289
Pityriasis Rosea, ... 290
Bibliography, ... 293
PAPULAR AFFECTIONS, ... 295
The Lichens, ... 297
L. Ruber, ... 302
L. Ruber Planus, ... 306
L. Ruber Obtusus, ... 313
L. Ruber Moniliformis, ... 314
L. Ruber Acuminatus Neuroticus, ... 314
L. Ruber Planus Corneus, ... 314
L. Planus Atrophicus, ... 315
The Prurigos, ... 324
Prurigo of Hebra, ... 326
Diathetic Prurigos of E. Besnier, ... 336
Prurigo Ferox of E. Vidal, ... 337
Prurigo Simplex, ... 338
Pityriasis Rubra Pilaris, ... 343
Lichen Scrofulosorum, ... 356
Bibliographical References, ... 361
BULLOUS AFFECTIONS, ... 363
Pemphigus, ... 365

PAGE
P. Vulgaris, ... 366
P. Vegetans, ... 369
P. Acutus, ... 370
P. Acutus Neonatorum, ... 371
P. Foliaceus, ... 373
Hydroa, ... 385
H. Vacciniformis, ... 386
Dermatitis Herpetiformis, ... 389
Pompholyx, ... 405
Bibliographical References, ... 410
PUSTULAR AFFECTIONS, ... 411
Impetigo, ... 413
I. Simplex, ... 414
I. Contagiosa, ... 418
I. Herpetiformis, ... 425
Ecthyma, ... 433
Sycosis, ... 438
Bibliographical References, ... 452
PHLEGMONOUS AND ULCERATIVE AFFECTIONS, ... 455
Furunculus, ... 457
Furunculus Orientalis, ... 461
Bibliography, ... 465
Gangrene of the Skin, ... 465
Dermatitis Gangrænosa Multiplex, ... 466
Spontaneous Gangrene; Hysterical Gangrene; Zoster Atypicus Gangrænosus et Hystericus, ... 471
Bibliography, ... 474
Phagedæna Tropica, ... 475
Bibliography, ... 478
DISEASES OF THE SEBACEOUS GLANDS, ... 479
Functional Disorders, ... 481
Seborrhœa, ... 481
Asteatosis, ... 497
Comedo, ... 498
Milium, ... 500
Sebaceous Cyst, ... 502
Structural Disorders, ... 503
Acne Simplex, ... 503
A. Rosacea, ... 516
A. Atrophica, ... 520
A. Hypertrophica, ... 521
A. Keloid, ... 521
DISEASES OF THE SWEAT GLANDS, ... 523
Functional Affections, ... 525
Hyperidrosis, ... 525
Bromidrosis, ... 536
Chromidrosis, ... 539
Uridrosis, ... 550
Phosphoridrosis, ... 551
Hæmatidrosis, ... 552
Anidrosis, ... 557

PAGE

Structural Affections, ... 559
Miliaria, ... 559
Hydrocystoma, ... 560
Hidrosadenitis, ... 563
Bibliographical References, ... 569
DISEASES OF THE HAIR AND NAILS, ... 571
The Hair, ... 573
Hygiene of the Hair and Scalp, ... 573
Twin or Triplet Hairs, ... 575
Hypotrichosis Congenita, ... 575
Hypertrichosis, ... 577
Atrophy of the Hair, ... 581
Alopecia, ... 581
Traumatic Alopecia, ... 582
Trichotillomania, ... 582
Senile and Premature Alopecia, ... 583
Alopecia of Seborrhœic Eczema, ... 584
Alopecia in Acute Infectious Diseases, ... 586
Alopecia of Leprosy and of Myxœdema, ... 587
Alopecia Caused by Folliculitis, ... 587
Alopecia Areata, ... 589
Canities, ... 596
Ringed Hair, ... 600
Fragilitas Crinium, ... 601
Nodular Diseases of the Hair, ... 602
Piedra, ... 602
Giovannini's Disease, ... 605
Lepothrix, ... 605
Monilethrix, ... 607
Trichorrhexis Nodosa, ... 610
Hodara's Disease, ... 613
Plica, ... 614
True Trichoma, ... 614
The Nails, ... 615
Hygiene of the Nails, ... 616
Congenital Affections, ... 617
Traumatism, ... 617
Discoloration in Argyria, ... 618
Onychauxis, ... 619
Onychatrophia, ... 620
Affections of the Nails in Diseases of the Nervous System, ... 621
Affections of the Nails in Syphilis, ... 624
Shedding of the Nails in Gonorrhœa, ... 625
Scleronychia, ... 625
Leucopathia Unguium, ... 626
Bibliographical References, ... 626
BENIGN NEOPLASMS, ... 629
Papilloma, ... 631
Verruca, ... 632
Cicatrix, ... 639
Keloid, ... 646

PAGE
Fibroma, ... 653
Fibroma Molluscum, ... 658
Lipoma, ... 660
Neuroma, ... 661
Xanthoma, ... 662
Myoma, ... 668
Angioma, ... 671
Nævus Vasculosus, ... 672
Telangiectasis, ... 674
Angioma Serpiginosum, ... 681
Angiokeratoma, ... 688
Lymphangioma, ... 684
Lymphangioma Circumscriptum, ... 686
Lupus Erythematosus, ... 691
Molluscum Contagiosum, ... 708
Rhinoscleroma, ... 714
Multiple Benign Cystic Epithelioma, ... 718
Adenoma Sebaceum, ... 721
XERODERMA PIGMENTOSUM, ... 725
History, ... 727
Development and Course, ... 729
Pathology, ... 732
Anatomy, ... 738
Etiology, ... 739
Diagnosis, ... 739
Prognosis, ... 740
Treatment, ... 741
Bibliographical References, ... 741
DERMATONEUROSES, ... 743
Classification, ... 749
Sensory Dermatoneuroses, ... 754
Dermatalgia, ... 758
Hyperæsthesia, ... 762
Pruritus, ... 765
Anæsthesia, ... 775
Perversions of Sensibility, ... 779
Motor Dermatoneuroses, ... 780
Cutis Anserina, ... 780
Vascular Dermatoneuroses, ... 782
Hyperæmic, Congestive, or Vasodilator Dermatoneuroses, ... 784
Anæmic or Ischæmic Dermatoneuroses, ... 798
Raynaud's Disease, ... 800
Hemorrhagic Dermatoneuroses, ... 807
Urticaria, ... 816
Œdematous Dermatoneuroses, ... 824
Hysterical Breast, ... 828
Trophic Dermatoneuroses, ... 832
Trophoneurotic Erythema, ... 833
Glossy Skin, ... 834
Acrodynic Erythema, ... 835
Vesicular Eruptions, ... 836

PAGE

Bullous Eruptions, ... 840
Pustular Eruptions, ... 842
Ulcerations, ... 843
Gangrene, ... 844
Scleroma, ... 845
Ichthyosis, ... 846
Pigmentary Affections, ... 847
Affections of the Appendages of the Skin, ... 849
Nervous Changes Concerned in the Production of Dermatoneuroses, . . 851
Dermatoneuroses cum Materia, ... 852
Dermatoneuroses sine Materia, ... 857
Treatment, ... 861
Of the Sensory Dermatoneuroses, ... 865
Of the Vascular Dermatoneuroses, ... 878
Of Raynaud's Disease, ... 880
Bibliographical References, ... 882
INDEX, ... 885

CONTRIBUTORS TO VOLUME V.

CHARLES W. ALLEN, M.D., New York.

Consulting Dermatologist to the Istituto Italiano; Formerly Surgeon to the City Hospital, Genito-Urinary Division, and Visiting Dermatologist to Randall's Island Hospital.

JOHN T. BOWEN, M.D., Boston.

Assistant Physician for Skin Diseases, Massachusetts General Hospital.

L. BROCQ, M.D., Paris.

Physician to the Hospitals; Associate Editor of the Annales de Dermatologie et de Syphiligraphie.

L. DUNCAN BULKLEY, M.D., New York.

Physician to the New York Skin and Cancer Hospital; Consulting Physician to the Hospital for Ruptured and Crippled, to the Manhattan Eye and Ear Hospital, and to the New York Hospital.

H. RADCLIFFE CROCKER, M.D., F.R.C.P., London.

Physician to the Skin Department of University College Hospital, and to the East London Hospital for Children.

JAMES NEVINS HYDE, M.D., Chicago.

Professor of Skin and Venereal Diseases, Rush Medical College.

MORIZ KAPOSI, M.D., Vienna.

Professor of Dermatology and Chief of the Dermatological Clinic and Ward, University of Vienna.

H. LELOIR, M.D., Lille, France.

Professor of Dermatology and Syphilology, University of Lille.

DOUGLASS W. MONTGOMERY, M.D., San Francisco.

Professor of Diseases of the Skin in the Medical Department, University of California, and in the San Francisco Polyclinic; Consulting Physician for Diseases of the Skin to the German Hospital.

ARTHUR VAN HARLINGEN, M.D., Philadelphia.

Emeritus Professor of Diseases of the Skin, Philadelphia Polyclinic; Formerly Dermatologist to the Howard Hospital, and Consulting Physician to the Dispensary for Skin Diseases.

HENRY H. WHITEHOUSE, M.D., New York.

Instructor in Diseases of the Skin, New York Post-Graduate Medical School; Clinical Assistant, New York Skin and Cancer Hospital.

ANATOMY

OF THE

SKIN AND ITS APPENDAGES.

BY

CHARLES W. ALLEN,

NEW YORK.

VOL. V.—1

ANATOMY OF THE SKIN AND ITS APPENDAGES.

C E Reed M D 1896.

As an introduction to a volume devoted to the diseases of the integument, no more fitting subject could be chosen than that which deals with the construction of the tissues whose pathological changes will be so frequently referred to.

The departures from normal conditions can be fully appreciated only when the reader has a clear conception of the histology of the organ in health. In diagnosis, too, much depends upon an exact knowledge of the tissue structure in which an eruption has its point of origin and of those involved in the development of the affection.

There is much, however, in the minute anatomy both of the skin proper and of its appendages which either has no direct bearing upon their diseases, or is still in a state of uncertainty. No attempt, therefore, will be made to render this chapter exhaustive, but a sketch rather will be given of our present knowledge of the anatomy of the skin with occasional reference to physiological function, especially where it bears upon disease processes.

The Skin.

In contemplating the integument it should not be simply in the light of an outward protective covering to the body, as something apart from the general economy which can be studied by and for itself alone. It should be looked upon rather as one of the important organs of the system, not only because of its excretory functions which are of such consequence, and of its office as a regulator of the bodily warmth, but also as being intimately associated with many internal structures and closely connected through its multitude of nerves and vessels with vital parts and as having to do with vital function. The integument may be defined as a complex, elastic, membranous organ of fibrous structure which completely invests the body, being continuous at all the natural orifices with the mucous membrane, or inner skin, and through its own deep connective tissue with the underlying structures throughout.

Besides the hair and nails, which are looked upon as appendages, the skin possesses systems of glands, vessels, nerves, lymphatics, muscles, and deposits of pigment.

The general surface is rendered uneven and in parts somewhat harsh to the touch by a vast number of furrows, ridges, or folds, projecting hairs, and depressed orifices. In many regions fine lines divide up the surface into quadrilateral or triangular spaces of irregular size. The color, which varies in the different races, depends chiefly upon the varying amount of dark pigment granules deposited in the lower strata of epidermal cells. In white races the color is supposed to be due to an optical effect produced by reflected light or to the combination of fat deposits in the deep connective tissue, anæmic state of the papillary layer, and translucency of the rest of the corium and epidermis.[a b]

Some parts, as the areola of the nipple, the labia, and the scrotum, are more darkly pigmented than others.

While the scalp, axillæ, and pubes are naturally covered with long hairs, all other parts excepting the palms, soles, glans and inner surface of the prepuce, clitoris, borders of the lips, and dorsal surfaces of the last phalanges of fingers and toes, are covered with a downy growth of lanugo hairs.

Again, while some regions have a delicate thin skin, others, such as the volar surfaces, are provided with a tough, thick epidermis suited to the requirements of the parts. The back and the extensor surfaces have relatively thick skin as compared with the anterior and flexor surfaces, and this has a bearing upon certain localizations of eruption and upon the pathological significance of lesions showing marked epithelial proliferation and hyperkeratosis. The direction and extent of the lines and folds of the skin already mentioned are not meaningless chance effects but follow definite laws of structural development,[3] and are arranged with the aim of facilitating motion over joint regions where the furrows are long and deep, and their number is proportionate to the varied motions of which the part is capable. When put upon the stretch the skin returns to its original position by virtue of the retractive power in its network of connective-tissue bundles intermingled with elastic fibres. Those lines and ridges which depend upon proliferation of the rete and linear depressions of the horny layer are termed "primary," and the physiological furrows developing from the constant creasing over jointed regions "secondary."[41] Upon the volar surface of the finger tips the curvilinear and sometimes spiral direction of the ridges is beautifully marked, remains unchanged through life, but is never alike in any two individuals. This has led to the suggestion of palmar impres-

sions being employed for purposes of identification. Under a magnifying glass, rows of sweat-gland openings can be seen, under suitable conditions of warmth or exercise, pouring out their droplets upon the surface. The linear depressed area is devoid of papillary eminences and for the most part the follicular openings are minute, though numerous, in the creases of the palm. *Lines of cleavage* (Fig. 1) have been described[5] for the various regions of the surface due to the distribution of the connective-tissue bundles, and the symmetry of the lines and their constant direction in different areas are accounted for by this architectural arrangement.[6]

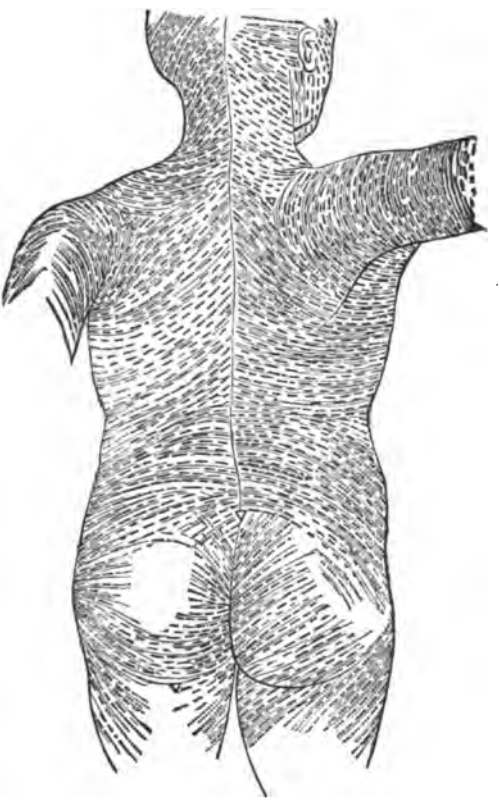

FIG. 1.—Lines of Cleavage of the Skin (Langer).

The skin proper is the *corium*, and it was long ago most properly called cutis vera in contradistinction to those layers of cells lying over the derma constituting the epidermis, and to the less dense connective tissue beneath it containing the fat, some coils of glands, hair bulbs, and Vater's corpuscles.

The *epidermis*, or *cuticula*, is made up of three distinct cellular strata of its own, originating from the embryonic ectoderm independently of the underlying papillary layer of the corium. The layers are, from without inwards, the horny or *stratum corneum*, beneath which is the pellucid area[7] or *stratum lucidum*, and, deepest of all, the soft mucoid mass of cells which sends down prolongations between the projecting papillæ of the corium, the *stratum mucosum*, likewise called rete mucosum and rete Malpighii.[8]

These various layers are in a constant state of growth and proliferation. The outer dense, tough, and resisting horn-like layer protects the cells beneath, and while the surface cells are being ever cast off in the form of branny plates, its integrity is maintained by accretions

from below; but that the dry horny plates are derived from the mucous layer is a view no longer held.[21]

The thickness of the epidermis as a whole varies in different regions but always in proportion to that of its horny layer. It is upon the volar surfaces that its greatest development is attained.

Unlike the rest of the skin, the epidermis has no vascular supply and is lacking in fibrous tissue. The cells are cemented together, as it were, by an albuminous product of the lymph which flows in the intercellular lymph spaces giving nourishment to the growing cells. The nerve supply is furnished by non-medullated fibres passing from the corium into the rete, forming plexuses between its cells,[37] the ends forming either bulbous swellings or undergoing gradual degeneration and transformation into nerve granules which may penetrate the inactive layers.[44] The existence of non-medullated fibres in the epidermis has been firmly denied.

The corneous layer, the thickest of the three, is composed of several strata of flattened scales having an irregular or spindle shape and being without nuclei for the most part, although one may be indistinctly seen at times in the deepest layers where the cells are least "wrinkled" and irregular.[21a] This layer, being a non-conductor of heat, plays an important part in the prevention of too great loss of bodily heat from the surface and in protecting the interior from the extremes of external temperature. It also has the function of guarding against too great evaporation of the fluids of the body, and being to all intents impermeable to fluids, solids, and gases from without, protects against the absorption of deleterious substances in such quantities as might prove of local or general injury. The horny cells manifest little or no evidence of life, granular protoplasm being present only in the basal and superbasal layers.[44]

The *stratum lucidum*, or shining layer, is not always well defined. It is a narrow zone lying between the lowermost cells of the horny layer and those uppermost in the rete, constituted by glistening, compact epithelia lying parallel to the free surface. This is not always described as a separate layer, being looked upon as a result of the chemico-biological change from rete into corneous cells.[28]

The *stratum mucosum* extends between the narrow bright layer and the papillary layer of the true skin. The upper strata of nucleated cells are distinctly granular, spindle-shaped, and lie parallel to the free surface. They have been described by some anatomists as a separate division of the epidermis under the name of *stratum granulosum*. The cells contain coarse granules,[37b] sometimes pigmented, and thought by some[44] to contain a fluid (eleidin[10]) and by others[28] a solid (keratohyalin), while it has recently been claimed that it is neither the

one nor the other, but a substance called chitin; a nitrogenous principle found also in the skin of insects and in the shells of crustacea.

It seems probable that these layers of granular epithelia play a part in the transition stage of the rete into corneous cells already referred to. Kromeyer[14] considers cornification a process which is independent of keratohyalin, taking place gradually and extending through the whole epidermis up to the corneous layer. It consists in a thickening and hardening of the cell membrane. Unna believes that the transformation into keratin implicates the outer layer alone. It is at the level of these granular cells that fluid exudations into the epidermis effect a separation of the layers when bullæ form or vesiculation occurs. This is explained by the lack of spines binding the cells together, as is the case with the deeper-seated prickle cells now to be described. The greater portion of the mucous layer is a soft mass of living protoplasm composed of nucleated polygonal cells with a chestnut-burr-like arrangement of certain delicate projecting spines, which connect the cells and fully warrant the designation prickle-cell layer[15] which has been applied to this part. These spines are of the same fibrous structure as the cells themselves."[17] It seems probable that spaces are left by the fusion of opposing prickle filaments through which lymph may circulate and possibly nerve threads may pass. The cells lying next the corium are cylindrical or columnar and have a perpendicular arrangement. From their bases these same prickly spines project, attaching them securely to the derma. Above these the cells are polyhedral in outline and have quite distinct nuclei and some nucleoli. (See Fig. 2.)

Besides the prickly spines fusing the cells of this horny layer to each other, a transparent albuminous cement[18] helps to make of them a compact resisting mass. The under surface of the rete is not a flat surface but one broken by innumerable teat-like projections or irregularities which dip down into the depressions caused by the projecting papillæ of the corium, thus locking, so to speak, the cutis and cuticula in an effective manner to resist friction or injury which might tend to displace the latter.

The *corium* or derma has, by reason of these papillary projections just mentioned, a greatly increased surface area, and since the papillæ contain vessels and nerves it furnishes a much closer vitalizing connection between the two chief divisions of the integument; and the tactile corpuscles, which are also abundantly distributed to these papillæ, are brought nearer to the surface of the body without encroaching upon the sum total of epidermic elements. Cutaneous respiration, the exchange of gases, and the exhalation of moisture are all favored by this arrangement of the vascular network, so analogous

to that found in the lungs. The vast number of these papillæ is realized when it is remembered how almost impossible it is to pierce the skin with the finest needle point without causing pain and flow of blood. The structural tissue of the corium is chiefly white fibrous and elastic, these components varying in their relative proportions with the requirements of the part as to resistance and extensibility. Upon the sole of the foot, where resistance is the chief requisite, white fibrous tissue predominates, while in the skin surrounding joints an abundance of elastic fibres is found. The bundles of connective tissue produce by decussation a dense meshwork which

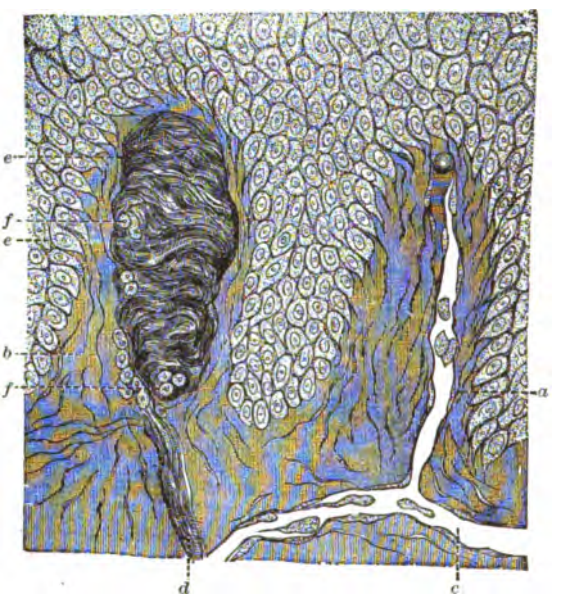

FIG. 2.—Papillæ Surrounded by Rete Cells (Biesiadecki). *a*, A vascular papilla containing branch given off from blood-vessel (*c*); *b*, a nervous papilla containing a tactile corpuscle (*e*), showing transversely cut medullated nerve fibres (*f*); *d*, a medullated nerve fibre contained in a thick nucleated sheath.

surrounds, supports, and protects the blood-vessels and lymph channels. There are also contained in the derma nerves with their terminal organs of touch and sensation, the coil and racemose glands, follicles which contain the hair roots, fat cells, muscles, etc.

Two layers are described: the *papillary* and the *reticular*. These have an imaginary boundary line separating them below the basis of the papillæ.

The *pars papillaris* has a wavy outline of projections and depressions interlocking with those of the overlying rete mucosum, and between these two strata is an indistinct hyaline substance possibly

identical[24] with the "cement" between the fibrillæ of the rete. The individual papillæ are constructed of a delicate, wavy, connective-tissue network of fibres showing nuclei and lying parallel to the long axis of the projections. When the epidermic covering has been separated from the papillæ and the cement substance has been removed they are seen to be surrounded by alternating delicate ridges and grooves. According to their contents the papillæ are known as vascular or nervous (Fig. 2), though some may contain both vessels and nerves, especially the so-called "compound papillæ," where two or more spring from a common base like teats from an udder. The largest and most numerous papillæ are to be found upon the volar surfaces, especially over the terminal phalanges where the fine surface ridges contain a double row. Upon the penis, nipple, clitoris, and lesser labia they are packed closely together. Upon the back, scrotum, and other parts they are infrequent, and in some regions their arrangement is such that definite groups or rows occasion surface markings[32] whose direction depends upon that of the connective-tissue bundles, the formation of which antedates that of the papillæ.[33, 35] It is estimated that upon a square millimetre of surface there are one hundred papillæ.[37] They vary in elevation from 0.02 to 0.05 mm.

The *pars reticularis* is of looser texture and the fasciculi of connective tissue have a more oblique direction. They are finer above and coarser below. This layer, which passes imperceptibly into the papillary layer, makes up the principal part of the derma and contains the glands, muscles, hairs, etc.

An elastic fibrous network, which permeates the whole corium with fibres running perpendicularly to the surface (Fig. 3) and, according to some observers, extending into the rete, has been demonstrated by Lustgarten,[38] with the aid of Victorian blue stain, after more incomplete methods with acetic acid, eosin stain, potash, etc., had failed. In the opinion of others[37] the fibres never penetrate the epidermic layer, but only seem to do so in sections which are too thick. The elastic fibres originate from the fascias and periosteum, bind together all the layers which they traverse, and give to the skin much more its quality of resistance than of true elasticity. The corium varies considerably in thickness, being thinnest upon the lids, prepuce, and inner surface of the greater labia, and thickest upon the back, soles, and palms. The deep or *subdermic connective tissue* is to be differentiated from the corium at about the third fœtal month and is the first portion to reach full development, being already at birth far advanced in this direction. It is separated from the derma by no appreciable line, and like it possesses an architecture depending upon fasciculi of connective tissue so arranged as

to form a meshwork enclosing rhomboidal spaces which contain groups of fat cells,[21b] having thin elastic capsules, which show an oval nucleus. The fat cells are separated from one another by fine connective-tissue fibres, and furnished with a capillary plexus having an afferent artery and one or two efferent veins.[21] This adipose structure, when abundant, is called the *panniculus adiposus*. It is absent in the lids, auricles, penis, scrotum, etc. In thick-skinned

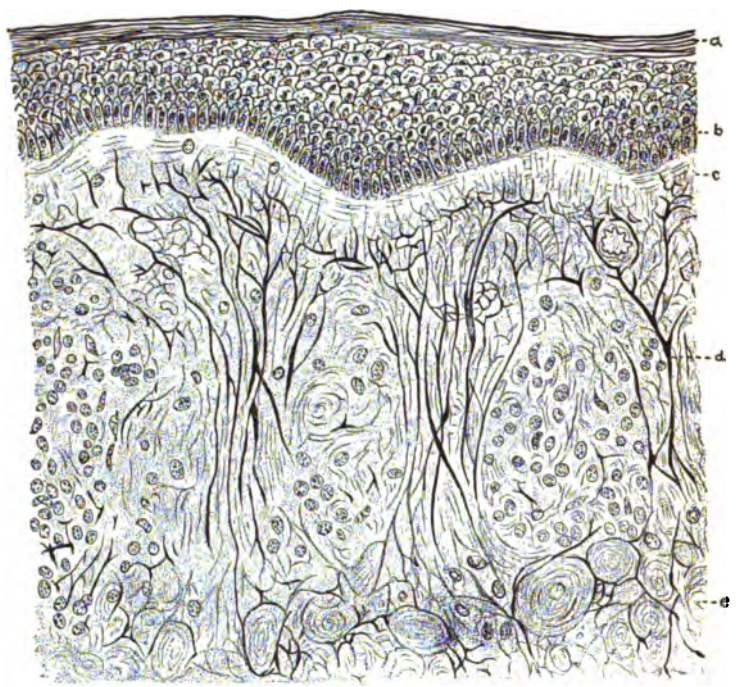

FIG. 3.—Elastic Fibres Colored by Victoria Blue (Lustgarten). *a*, Horny epidermis; *b*, mucous layer; *c*, papillary layer of corium; *d*, network of elastic fibres; *e*, fat lobules.

parts *columnæ adiposæ*[22] containing a coil gland, which they help to support,[23] pass upwards to the base of some hair follicles. They extend from the stratum adiposum in an oblique direction parallel to the arrector pili muscles. It seems probable that, besides having definite physiological functions, these fat columns afford a means of egress for certain morbid products, as is especially illustrated in sarcoma and anthrax simplex. This layer also contains the coiled portion of many glands, hair papillæ and follicles, blood-vessels, lymphatics, nerves, and peculiar bodies found connected with the nerves—the corpuscles of Vater.

Glandular Structures.

Situated in the corium for the most part, but to a limited extent also in the connective-tissue layer beneath it, are found two sets of glands: the racemose (*sebiparous*) being more superficially located and in connection with the hairs; the convoluted (*sudoriparous*) glands either in the lower derma or upper portion of the connective-tissue layer. The *sebaceous glands* are located exclusively in the corium. Some occur as appendages of the hairy system and are appropriately designated glands of the hair follicles,[14] and several are often seen grouped around a single follicle. The others are more complex structures whose ducts open directly upon the free surface. These larger glands are distributed mostly over the regions covered with lanugo hairs, and now it is the hair which has the rôle of appendix, finding its exit to the surface through the gland duct. A third variety occurs quite independent of hair growth as exemplified in the *glandulæ odoriferæ* of the genitals in both sexes, the Meibomian glands,[15] and those situated about the mucous orifices and the areola of the nipple. Chemical analyses of sebum have thus far disclosed besides water, cast-off epithelial structures, fatty and granular matter, alkaline and earthy phosphates, chlorides, palmitin, olein, and cholesterin. The arrectores pilorum, by their contraction, undoubtedly aid in forcing out the sebaceous matter from the ducts.

The coil glands (sweat or sudoriparous glands) have a secreting portion which is seen as a small, yellowish, rounded mass made up of convolutions, situated in the reticular portion of the derma or in the upper part of the subdermic connective tissue (Fig. 4). Their excretory duct passes up through the corium, following a particularly straight course and through the epidermis in a strikingly wavy or corkscrew manner (Fig. 5, *s*), to open upon the skin surface in a minute pore. The secretion of these glands is seemingly the result of a twofold function. Habitually they pour out upon the surface an oily fluid suitable for keeping the surface properly lubricated, especially in those regions where no sebaceous glands exist, as upon the palms and soles, where indeed they are abundant and arranged in rows. It is estimated that there are twenty-six hundred or more glandular openings to the square inch,[16] the total number for the whole body being given as two million [17] or more.[18]

The secreting portion of the coil has as a lining a layer of cuboidal epithelia, while columnar cells line the duct as far up as the rete level. In the interpapillary space the duct is constituted of stratified epithelium, prolongations of those of the rete.

The development of the gland may begin as early as the third month of intra-uterine life, but usually it is the fifth month before the first rudiments are discovered. In the seventh month the canal is produced and in the ninth the tube is coiled upon itself and the gland proper is formed.[56]

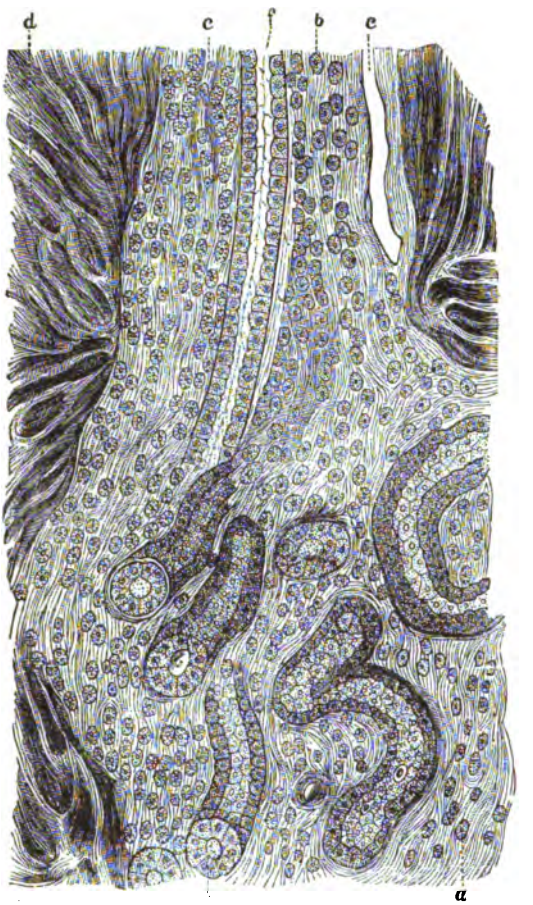

FIG. 4.—Coil and Duct of Sudoriparous Gland in Transverse (*e*) and Longitudinal (*f*) Section. *a*, *b*, Pathological cell infiltration; *c*, blood-vessel supplying gland; *d*, connective-tissue bundles.

Special varieties of glands are the circumanal and those of Moll, which latter occur upon the eyelids and empty their product into the follicles of the cilia or Zeiss' glands.

Besides maintaining the natural unctuousness of the surface by constantly giving off "insensible perspiration," the coil glands pour out daily about two pints of watery fluid containing some two per cent. or less of solids, chiefly chloride of sodium, some fat, cholesterin, urea, carbonates, phosphates, and organic acids.

According to recent investigations,[44] the watery constituents are derived from the tissues traversed by the straight portion of the tube, while the fatty matter comes from the coiled portion.

Unna[44a] credits F. Simon with the discovery of fat in the sweat, though Krause thought that the elder Leeuwenhoeck[39] had made the same observation. The first positive scientific proof was given by Krause[44] fifty years ago.

Meissner[43] attributed to the coil glands the function of secreting fat alone, not looking upon it as reasonable that a gland should exude continuously a secretion constituted almost entirely of fat, and then suddenly pour out a great quantity of watery solution. Unna

now maintains, as he did in 1881, that all coil glands contain and secrete fat at times. He had found free fat in the lymphatic spaces of the derma and epidermis in the form of variously sized corpuscles and in the form of fine droplets in the epithelium of the conduits of sudoriparous glands. In forty-eight out of fifty-three cadavers he found fat in the coils, very abundantly present in almost half."[b] He believes the fat from the finger tips is mainly stearin while not fully excluding palmitin and even cholesterin.

If the palm, previously cleansed with soap and then with ether, be held in the sunlight and observed with a strong glass, minute, shining points of perspiration may be seen to start up from the summits and sides of the variously disposed ridges, and after a moment's duration seem to evaporate or to be imbibed again by the tissues. Here and there, however, in or along the large transverse folds the droplets persist and show the play of colors characteristic of oil floating upon water. This simple experiment is suggestive of the possible power and province of the glands to secrete the oily form of lubricant when and where it is most required under appropriate stimulation. An osmic-acid test will confirm the presence of fatty matter.

It seems more than probable that not only is there a nerve influence governing sweat secretion, but that this function is influenced by special nerve control—in other words, that there exist sweating centres, probably in the cord, which can be stimulated to produce regional and special forms of perspiration.

The nerves which induce sweating may act independently of the vasomotor fibres, thus explaining how sweating occurs not alone when the skin is red and the vessels full, but also in states of pallor when the cutaneous circulation is languid."[a]

Vascular System.

Blood-vessels are abundantly supplied to the skin in all regions. Two distinct parallel and horizontal sets of vessels exist; one in the corium just beneath the papillæ, which receive their vascular loops from it; the other deep down in the connective-tissue layer at the level of the fat and sudoriparous coils. The skin appears to have three distinct vascular districts," each supplied with arterioles and roots of veins of its own."[a] The lowest has many arterioles to supply the fat tissue, while each coil has an individual plexus; the middle, derived from branches given off from the ascending trunks, furnishing nourishment to the hair follicles and sebaceous glands, connective and muscular tissues; and finally, in the subpapillary layer there is an extensive plexus from which loops pass up into the numer-

ous papillæ (Fig. 5), excepting those as a rule which contain tactile corpuscles.[66] The venous plexus accompanies the arterial in all parts, and in some at least there is free anastomosis between their smaller branches.[28, 62, 66] In regions where the skin is liable to be stretched the vessels are of unusual length,[66] and generally the arteries are small as compared with the veins.[28] The epidermis has no vascular supply.

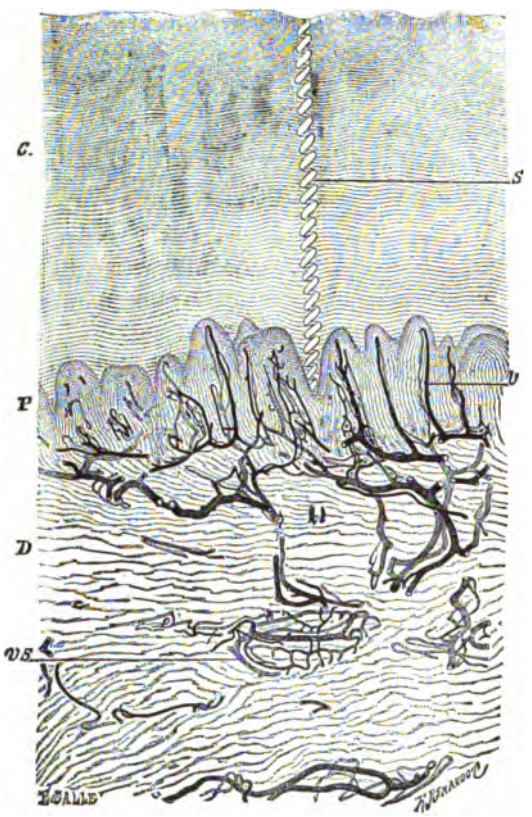

FIG. 5.—Vascular Loops Occupying the Papillæ of the Corium (Ranvier). *C*, Epidermis; *S*, corkscrew course of coil-gland duct as it passes through the epidermis; *P*, papillæ occupied by arterial and venous capillaries (*v*) from the papillary or superficial plexus; *D*, corium, with delicate plexus (*vs*) to supply the coils of sweat glands, and portion of the deep horizontal plexus, from which it is given off.

Lymphatic. — Vessels and lymph or juice spaces have a distribution, our knowledge of the definite arrangement of which is still in the investigation stage.

It is known, however, that in the subdermic connective tissue large lymphatics show the rudiments of a muscular apparatus. Smaller vessels form a network in the upper portion of the corium beneath that of the subpapillary blood-vessels. Anatomosing branches join the superficial and deep lymphatics. Lymph channels exist in all parts of the skin,[64] usually devoid of independent walls. Some originate in open, some in closed lymph spaces.[48] Their relation to the lymphatic vessels has not been definitely determined. There are intercellular lymph spaces in the epidermis which seem to connect with the lymphatic system of the derma, since they have been injected from below.[30] The sebaceous glands, the ducts of the coil glands, the prickle layer of the hair follicles, and the bed of the hair have the same interepithelial juice spaces as the epidermis.[11] The papillary layer has its own enclosed system.[28a] Near the base

the spaces become confluent and a lymph vessel begins to form and enters the papilla.

The Muscles.

Muscles of both varieties are present in the skin, but the striated are found only here and there in the face and neck, especially about the chin, lips, nose, and eyebrows. Smooth muscles occur in horizontally disposed plexuses, as in the scrotum where they are prominent under the name *tunica dartos;* in connection with hair follicles and sebaceous glands arranged as fasciculi; and in the corium arranged in strata lying perpendicularly [44] to the lines of cleavage,[45] which are made prominent by their contraction.

The *arrectores pilorum* [32, 14] spring from the papillary layer and pass obliquely to their insertion in the middle portion of the hair follicles, which is their more fixed point.[46] They are surrounded and traversed by a network of elastic fibres, and terminate in veritable tendons composed of long elastic fibres through which their action is transmitted.[47, 44, 21] Upon the scalp they are very abundant and about the areola they have a circular arrangement. Their contraction and movement are favored by their lying in distended lymph spaces. When general contraction takes place over the surface, *cutis anserina,* or goose flesh, is produced—a condition which probably has a greater significance in the way of regulating secretion and excretion and protecting the body from sudden temperature changes and other deleterious effects than is usually attributed to it.

Pigmentation.

The pigmentation of the skin is due to a faint staining of the cells. The color in different individuals and races depends upon deposits of pigment in the lower cells of the rete, and is modified by the degree of vascularity of the skin which gives the flesh tint. The true pigment, melanin, is deposited as fine granules in the cells. In the dark races there are pigment cells in the corium, and although negro children are born apparently white, pigment deposits have been discovered at least a month before birth.[48] When negro skin is transplanted upon a white man the pigmentation is soon lost, while the white becomes pigmented if engrafted upon the negro skin.[50]

The pigment is either carried up by leucocytes from the underlying tissues[8, 13]—migratory pigmented epithelia entering between the deeper epithelial cells[13a]—or it is formed within the protoplasm of the cells which have migrated without pigment.[13]

Nerves.

Both medullated and non-medullated fibres are abundantly distributed to the skin, its organs, and appendages. They spring from branches more internally situated, and as a general thing follow the course of the blood-vessels, like them forming a network in the subpapillary layer.

Complicated terminal endings to the nerves are found in many situations, and especially is this true of the extremities and such surfaces as naturally encounter external objects. Through these organs cognizance is taken of the quality and nature of substances touched. We have the tactile corpuscles of Meissner[45] and Wagner,[46] the corpuscles of Vater, the bulb corpuscles of Krause,[47] and the touch cells of Merkel.[48]

Tactile corpuscles, which are located chiefly in the papillæ, are composed principally of nucleated connective tissue.[47a, 63] Entering at the base or sometimes at one side of the oval mass are to be seen one or more medullated nerve fibres whose fibrillæ penetrate and encircle it in various directions. Each corpuscle almost fills a papilla, but at times there are two or even three present, although occasionally a certain nerve constriction may give the misleading impression of the existence of two bodies.[46] Nearly one-fourth of the entire number of papillæ upon the finger tips are supplied with these touch corpuscles.[48]

In regions where these bodies are infrequent, as upon the abdomen, certain other touch-cells have been discovered[48] which lie in the uppermost layers of the cutis. It is probable that they are connected with nerve endings and serve a purpose in the perception of the more delicate nerve impulses.

Vater's corpuscles, probably more commonly but less justly called Pacinian,[50] are another variety of terminal endings of medullated fibres found most abundantly in the deep connective tissue of the skin in the palms and soles, especially over the toes and fingers, as well as upon the penis, and sparsely scattered through the corium in many other regions of the body. They are large enough to be seen by the unaided eye, measuring from 1 to 4 mm. in the long diameter or ten times as much as the tactile corpuscles, but are of much the same oval form. Lamellæ of more or less concentric arrangement enclose a narrow cylindrical cavity filled with a transparent substance surrounding the axis cylinder, which divides near the distal end of the clear space into two or more branches, and these terminate in irregular enlargements. As the nerve enters this capsule its medullary sheath and

sheath of Schwann are lost. Instead of the axis cylinder splitting up into fibrillæ and ending in thickened extremities it may pass from the apex of the capsule as an efferent nerve.[a] If it proceed to enter a second corpuscle all of its membranes form again. The deep situation of these bodies renders it scarcely probable that they are true corpuscles of tactile sensation.

End bulbs,[b] which resemble the inner structure of the Vater corpuscle, supply a mode of termination for certain fine nerve filaments coming from the deeper plexus.[a] They should be distinguished from the Meissner corpuscles, never being found side by side with them and differing also in structure and appearance.

Merkel's touch cells also occur in the superficial corium in regions where tactile corpuscles are few in number, as upon the abdominal surface. Their discoverer regards them as organs for the finer perceptions.[c] They are generally of oval structure and contain a clear nucleus and nucleolus; the medullary sheath of the nerve envelops the cell. Tactile corpuscles always contain several tactile cells.

Physiologically the cutaneous nerves are both sensory and motor. The vasomotor probably comprise dilators and constrictors. That the capillaries of the papillæ are under direct nerve influence is indicated by the presence of a network at the periphery of the papillæ which contains vessels, fibrils from which end in thick extremities upon the capillary walls. This explains the fact of localized exudation as a result of irritation over a given point. Contrary to the belief entertained a quarter of a century ago, it is now well established that non-medullated fibres do exist and that they pass up from the papillary layer and form delicate ramifying plexuses between the prickle cells of the rete. Their exact mode of final termination has not been definitely settled.

Appendages of the Skin.

The hair and nails must be looked upon as the true appendages of the skin if any structures are to be thus described, though some writers have made this term include the glandular apparatus.

The Hair.

The hair has two portions: that implanted in the skin being the *root*, that which projects above the surface the shaft. The other important parts whose anatomy should be studied are the hair follicle and the hair papilla.

The hair shaft and root are constituted principally of cortical substance or fibrous tissue made up of spindle-shaped bundles of fibres

showing longitudinal striations, for the most part uniformly colored and often containing pigment granules. Smaller plates or lamellæ of fibrous substance having irregular borders go to make up the bundles. The central medullary portion consisting of embryonal corpuscles is frequently pigmented.

The *cuticle* of the hair is a transparent investment covering shaft and root and composed of lamellæ without nuclei arranged in an imbricated fashion which under amplification suggests fish scales. The free ends look towards the point of the hair.

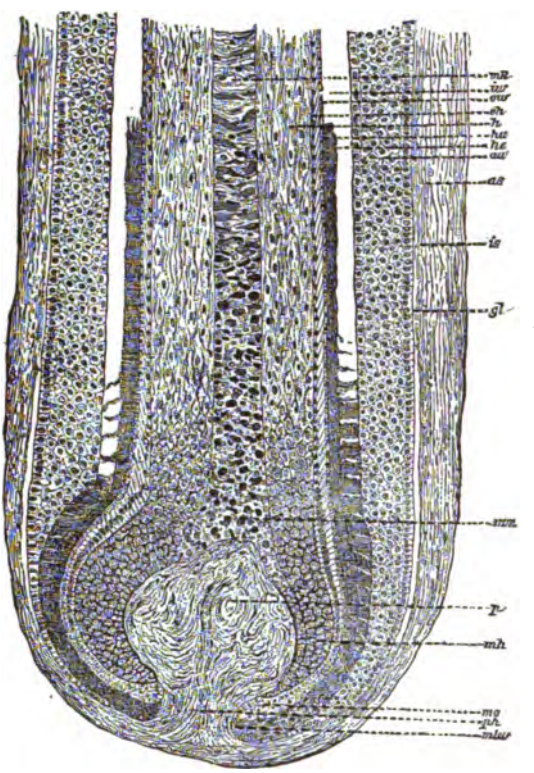

FIG. 6.—Hair of the Beard Seen in Longitudinal Section (Unna). *as*. External sheath of the follicle ; *is*, internal sheath of the follicle ; *gl*, vitreous membrane of the follicle ; *aw*, prickle-cell layer of the follicle ; *iw*, root sheath of the hair ; *ow*, cuticle of the root sheath ; *oh*, cuticle of the hair ; *h*, cortex of the hair ; *mk*, medulla of the hair ; *p*, papilla ; *ph*, neck of the papilla; *he* and *hu*, so-called sheaths of Henle and of Huxley ; *miw*, *mo*, *mh*, *mm*, matrices of the corresponding parts.

The *hair follicle*, in which the root is encased, is a connective-tissue, pouch-like structure formed from the derma which it often penetrates, invading the subdermic connective-tissue layer. It opens by a *mouth* upon the free surface and has a *neck* or constricted part just below the papillary layer where the duct of the sebaceous gland enters, and ends in a wide extremity. The follicle is virtually a dipping in of the corium and its rete covering, to form a deep receptacle for the hair, and is provided at its deepest part with the hair papilla which grows from it and upon which the bulb of the root is implanted. It has an external or dermic and an internal or epidermic coat.[20a] The *external coat* consists of connective-tissue fibres containing arteries, veins, and in its outer portion a nerve. The bundles of connective-tissue fibres run parallel to the hair. Here and there are seen circularly disposed muscular fibres derived from the arrector pili,

which is attached to the external part of the follicle wall. The innermost layer is one of structureless basement membrane separating the follicle from the root sheath. It shows upon its inner surface fine dentations. The *epidermic coat*, being the result of a turning inwards of the cutaneous rete, forms the prickle-cell layer of the follicle;[20] the granular and horny layer of the epidermis persist only to the opening of the sebaceous gland. Beyond this the cells of the mucous layer alone continue down to the level of the papilla, where they taper off into one or two rows of cells and merge with those of other layers; the mucous layer is thus thickest in its middle portion. This coat has usually been described as the outer root sheath of the hair, lying flat against the vitreous membrane which lines the fibrous sheaths of the follicle. It has nothing to do with the hair formation and more properly belongs with the follicle.

The *papilla* is structurally a connective-tissue formation of delicate fibres connected to the main body of the corium through the bottom of the follicle by a pedicle or tract of fibrous tissue which also carries the blood-vessels. It contains many pigmented as well as unpigmented corpuscles, or spindle-shaped protoplasmic bodies, besides blood-vessels, which at the apex form a loop similar to that in the dermic papillæ. Little is known concerning the nerve supply,[21] but non-medullated fibres are said to exist.[16]

The *root sheath* proper of the hair is that usually described in dermatological works as the internal root sheath and as consisting of two layers: an outer (sheath of Henle) and an inner (sheath of Huxley). The outer consists of finely granular pale cells, either entirely without or with very indistinct nuclei.

The inner layer is more coarsely granular, has shorter and broader polyhedral cells with distinct nuclei. The root sheath extends from the opening of the sebaceous follicle down to the hair bulb, which is constituted by the reduplication of its inner layer in the bottom of the follicle where it surrounds the papilla. The hair is produced from the root sheath, of which it can be regarded as a solid elongation.

A so-called cuticular layer or membrane separates the root sheath from the cuticle of the hair.

The hair begins to develop about the end of the third month of fœtal life but it does not grow out to the free surface until the sixth. There is first a downward prolongation of rete epithelium, and subsequently an extension of connective tissue which produces the papilla. The hair elements all spring from medullary epithelia.[21] New hair growth takes place around the papilla from the bulb which remains behind, when, after reaching its limit of existence, a hair is shed.

The hair arises from the central portion of the root sheath, which part contains the pigment. The formation of the root is analogous to that of the horny layer of the epidermis from the rete, although the granular layer from which the horny layer is thnught to spring does not penetrate, as we have seen, lower than the neck of the hair follicle.

At times two or even three hairs can be counted in a follicle, and, upon the scalp especially, grouping of the follicles is the rule, the groups being separated by interlacing bundles of connective tissue.[8] The direction of these bundles may cause a certain curved outline to be given to the implantation of the hairs of a given region, as for instance upon the vertex where veritable whorls are commonly present. The color of the hair depends not alone upon the presence of pigment granules and soluble pigment, but also upon the presence of air, bubbles of which may be seen in extracted hairs. These may produce a whiteness in the cortex while the central portion remains darkly pigmented.[8]

The lanugo or downy hair is without medulla and this as well as blond hair is lacking in pigment granules. The curl in hair depends upon the curve of implantation beneath the skin,[9] being in the negro equal to the quarter of a circle. The hairs of the scalp are estimated at about one thousand to the square inch or one hundred and twenty thousand in all.

The Nails.

These are shield-shaped aggregations of horny epidermic scales, implanted by three of their margins in a fold of skin capping the distal phalanges, their concave surface resting upon the nail bed, their posterior and lateral borders being closed over by the nail fold. That portion which is covered by the posterior fold is called the *root*, and lying beneath this is the *matrix*, while the part beneath the body of the nail is called the *nail bed* proper. Separating them is the *lunula*, which is seen through the otherwise pink nail as a white area at the posterior extremity. The biconvex space corresponding to the lunula has no papillæ and hence should not be included in the matrix.[10] A layer of opaque granular cells exists just back of the free margin, causing the red color of the nail bed to end abruptly in a yellowish band.[11] It is due to the presence of opaque elements causing decreased transparency. The posterior and greater portion of the lateral margins are firmly inserted in the nail *groove* or fold between the matrix and surrounding skin.

From above downwards we have in the nail bed the same elements as in the skin—rete, corium, and deep connective tissue. The nail

itself is a modification of the stratum lucidum.' Towards the free border the papillæ increase in size and the vascular supply throughout is abundant.

The bed of the nail blends by the intervention of connective-tissue fibres with the periosteum.

The epidermis bordering the nail is called the *perionychium*. The *eponychium* is that film of "nail skin" which covers the body of the nail for a limited distance. It comes from the epitrichial layer,' is horny in part, and from beneath it the fœtal nail develops.

The *hyponychium* is the epidermic layer upon which the body of the nail rests.

The nail begins to form in the third fœtal month, showing first as two or three projecting rows of rete-like epithelial cells. By the eighth month it is already highly developed.

Growth takes place from the matrix and thickening from the corneus cells of the body of the nail. In the bed the formation of horny plates goes on rapidly. In the matrix the transition from mucous cells is slow and gradual, hence the much softer tissue which results.

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PARASITIC DISEASES.

BY

L. DUNCAN BULKLEY,

NEW YORK.

PARASITIC DISEASES.

THE discovery by Schönlein, in 1839, of a fungus in the crusts of favus, and the positive establishment by Eichstedt and others, about the year 1846, of the itch insect as the sole cause of scabies, marked an era in the study of diseases of the skin. Before that time all eruptions were regarded as of constitutional origin; since that date the microscope has played an important part in the development of dermatology, and many conditions of the skin which were formerly thought to be due to particular blood states are now recognized to be dependent upon local causes in the form of parasites. These may be divided into three classes, namely, animal, vegetable, and microbic—of uncertain nature.

The field of observation in the study of local pathology is widening every day, and it is quite possible that in the future many more diseases will be included under the class of parasitic than are now demonstrated to be such, especially as regards those of microbic origin. Already some authors have classed many as parasitic which others are not willing to grant. The advances in bacteriology in recent years are demonstrating large numbers of micro-organisms in connection with most varied conditions or diseases of the skin. Some of these microbes have been proven beyond doubt to be capable of producing disease, but how far their power is absolute or how far it depends upon a proper soil or condition of the system has not yet been demonstrated. It is more than suspected that some of them are themselves dependent upon the diseased process, and are the results rather than the cause of the disease.

In regard, however, to the first two classes of parasites, those long known as animal and vegetable, there is no doubt but that they are the direct causative agents producing the diseased states of the skin connected with them; although, as will be seen later, in many cases the results vary greatly according to the constitution or condition of the patient on whom they operate.

With regard to the third class, or microbic, the true pathogenic nature of some of the organisms which have been found associated with them is yet so uncertain that they are only tentatively placed

in this category, as suggestive of further study. As will be seen later, many of the micro-organisms are only those of very common form, abundant everywhere, and which are not generally recognized as pathogenetic. In relatively few of the diseases has the true etiological character of the microbes been proved by cultivation and inoculation.

Parasitic diseases of the skin will be treated of under the following divisions:

A. Diseases caused by animal parasites.
   I. Diseases or conditions produced by animal parasites living on or attacking the skin.
   II. Diseases or conditions produced by animal parasites penetrating the skin, either themselves or their larvæ.
B. Diseases caused by vegetable parasites.
C. Diseases caused by micro-organisms of uncertain nature.

The following list represents the animal parasites which at one time or another have been observed in connection with lesions on the skin. Some of them are very common, as will be noted later, but the majority of them are rarely met with in this climate.

I. Animal Parasites.

A. Living on or Attacking the Skin.

1. Pediculus: (*a*) capitis, (*b*) corporis, (*c*) pubis, or louse of head, body, and pubis.
2. Cimex lectularius, or bedbug.
3. Pulex irritans, or flea.
4. Ixodes, or wood tick.
5. Dermanyssus, or bird mite.
6. Culicidæ, simulidæ, tabanidæ, or mosquitoes, gnats, midges, and flies.
7. Apidæ, vespidæ, araneina, or bees, wasps, spiders, etc.
8. Hirudo, or leech.

B. Penetrating the Skin, Itself or Its Larva.

1. Sarcoptes (or acarus) scabiei hominis and communis, or itch mite.
2. Leptus autumnalis, or harvest bug.
3. Pulex penetrans, or jigger.
4. Demodex folliculorum, or comedo mite.
5. Dracunculus (or filaria) medinensis, or Guinea worm.
6. Filaria sanguinis hominis.

7. Craw-craw.
8. Cysticercus cellulosæ.
9. Echinococcus cutis.
10. Distoma hepaticum, or liver fluke.
11. Bilharzia (or distoma) hæmatobia, or blood fluke.
12. Œstridæ, or bot flies.
13. Muscidæ, or common flies.

A. ANIMAL PARASITIC DISEASES.

I. By Animal Parasites Living on or Attacking the Skin.

1. Pediculosis.

Synonyms.—Phthiriasis; morbus pedicularis; lousiness; Fr., *Phthiriase;* Ger., *Lausesucht.*

Three forms of pediculi are found upon the human skin, which are named according to the regions most commonly occupied by them (the head, body, and pubis) *pediculus capitis, pediculus corporis,* and *pediculus* (or more properly, *phthirius*) *pubis;* they are alike and yet distinct in form and shape. Their presence and their efforts to secure nourishment by extracting blood, produce an irritation of the skin which leads to scratching, whereby an artificial dermatitis is excited. This presents various degrees of inflammation, which vary considerably according to the region attacked, the numbers of the lice, the duration of the disease, and the health of the individual. The parasites always remain on the surface and deposit their eggs on the hairs or the clothing and not in the skin.

(*a*) *Pediculosis Capitis.*

The presence of lice in the head is very common among children of the poorer classes, but may also occur even in those in the highest walks of life. It is less common in adults, and is still less frequently seen in men than in women. When neglected, the insects will swarm in great numbers, but are commonly kept in check so that there may be relatively few present; often, however, even with considerable care, it will be extremely difficult to get entirely rid of them without properly directed treatment.

The irritation from the presence of lice varies very greatly with different individuals. Occasionally a head may be seen literally alive with them and yet there may be relatively little discomfort, while in other cases a few insects will give rise to intense itching, causing a very great amount of inflammatory action from the constant scratching. In old and extremely neglected cases (rarely seen in this coun-

try), the hair becomes matted together with the exudation and filth, and forms a hard covering over the scalp, which can be removed in a solid, compact mass by clipping the hairs beneath: this is the *plica polonica* of older writers.

When pediculi are few in number they are more commonly found in the occipital region; later they and their nits appear everywhere. At first there will be seen but a few points which have been scratched by the finger nails, upon which small crusts appear. As the itching continues these crusts are torn off, and larger raw surfaces appear, which, as the inflammation increases, give off a gummy fluid, more or less matting the hair. Later, pus infection takes place and the crusts are larger and darker; or, if kept free by washing or cleansing, raw surfaces of very considerable extent occur. As the inflammation of the skin increases, the glands at the back of the neck enlarge, and even those at the sides may be affected; they rarely suppurate, however, but subside when the scalp trouble is removed.

Associated with the eruption on the scalp there may often occur, in suitable persons, an eczematous eruption above and behind the ears, and on the neck; also lesions may appear on the face and elsewhere, caused by the transference of the pus infection from the scalp by the scratching finger nails.

Etiology.—The eruption is wholly due to the presence of the pediculi, and ceases when they are completely removed; except, of course, an eczematous inflammation may be lighted up by the parasitic trouble or its treatment which may require other measures. The pediculi are always acquired from without, and never develop in the scalp as a consequence of any eruption, as is often popularly supposed. They gain access to the scalp by contact with others, as in bed or otherwise, or by means of head coverings, and by brushes, etc. When apparently cured the trouble may recur from the hatching out of fresh insects from nits which may still adhere, unobserved, to the hair.

FIG. 7.—Pediculus Capitis. Microphotograph. (After Shoemaker.)

Pathology.—The lesions on the skin belonging to pediculosis capitis, as stated, are wholly due to the scratching indulged in to relieve the itching, caused by the insects and the subsequent inflammation, and exhibit only the usual appearances of artificial dermatitis.

The insect (Fig. 7) is too well known to require much description. It is of a whitish-gray color, easily recognizable, about one-tenth of an inch long and one-twentieth of an inch wide, moving slowly, if at all, and holding on more or less firmly to the hairs. It has six legs attached to the front part of the

body, with prehensile hooklets. The females, which are larger than the males and also more numerous, lay a large number of eggs, which hatch out with great rapidity, in from three to eight days; the young attain maturity in about twenty days. It is stated that a single female can lay fifty eggs in six days, and so have a progeny of five thousand in eight weeks. Undoubtedly many perish or become removed by brushing, for even under the most exaggerated circumstances we rarely see any number of the insects at all to be compared with these figures. But the rapid multiplication of lice on corpses, where their development has been unhindered, may be thus well explained.

Fig. 8.—Nits of Pediculus Capitis. (After Anderson.)

The eggs are deposited on the hairs (Fig. 8), to which they are firmly attached by a peculiar hard substance, and are so placed that they slant toward the free extremity of the hair, and cannot be removed by combing; when recent they can hardly be moved with the finger. There may be one or several on a single hair.

Diagnosis.—Scattered and scratched points in the scalp, especially when seated near the occipital region, should always suggest pediculi, and if present, a careful search will often show the nits, even if the insects have been removed. The nits may be confounded with branny particles of epidermis. These latter, however, are freely movable, whereas the nits are readily distinguished by their passing under the finger as it is moved along the hair.

The eruption attending pediculi may simulate an *eczema*, *impetigo contagiosa*, and also a *pustular syphilide*, and even possibly a *psoriasis*. It is to be remembered, however, that pediculi may also occur in connection with any of these, and likewise in connection with any other scalp eruption. Sufficient care in searching for the nits will always reveal them when the insects are present.

Treatment.—Various remedies will destroy the insects, but the success of treatment depends much upon the thoroughness of the application. The simplest method is to soak the scalp for twenty-four hours with the cheapest kerosene oil obtainable, which contains the greatest percentage of the volatile elements. The application should be renewed three times in twenty-four hours, the head being bound up in a towel. As a rule the insects will then all be dead and the nits loosened on the hairs. The scalp is now washed well, and carefully, if there are raw surfaces, and to these latter is applied some mild ointment, as zinc, bismuth, or weak white precipitate,

each with a little carbolic acid. If there should still be any itching, and especially if there are new nits, not loosened, on the hairs, the oil may be re-applied for another twenty-four hours. This application of oil is not so very unpleasant, and is readily made even in private practice. It may sting some if there is much raw surface.

Other remedies such as infusion or ointment of stavesacre, also infusion of quassia, quite strong white precipitate, sulphur, or carbolic ointment, all serve a good purpose, but are slow and relatively ineffective compared to the kerosene. Lotions of bichloride of mercury are not safe to place in a patient's hands.

It is seldom necessary to cut the hair in females. Even when greatly matted and with abundant nits, the oil will so soften the mass that it can be disentangled with patience. The nits will slowly work off after their vitality has been destroyed by the kerosene, especially by first holding the hair by the ends and combing it towards the scalp, with a fine-toothed comb to loosen them. When the oil has not been used they may be loosened by borax and glycerin, or acetic-acid solutions.

(*b*) *Pediculosis Corporis.*

The louse which produces this condition, the pediculus corporis, should more properly be called pediculus vestimentorum, because as a rule the real habitat of the insect is the clothes, and its eggs or nits are on the fibres of the underclothing; this will be seen to be an important point in connection with the recognition of the trouble.

Unlike the louse of the head this insect is found much more commonly in adults than in children, and in men, perhaps, even oftener than in women. It is especially common among the poor and underfed, and not very often seen among those of the well-to-do classes. When lice chance upon those who are in good health and cleanly they seldom remain or propagate greatly, although sometimes they may persist in spite of the greatest care.

As in pediculosis capitis, the eruption which is seen to accompany body lice is due to scratching, practised to relieve the pruritus caused by the presence of the insects and their attempts to draw blood. The lesions found will vary from a few scratched papules, or possibly some long abrasions by the finger nails, to a great extent of scratched and torn surfaces, with crusts, among pustules and even ecthymatous boils. These self-inflicted wounds are commonly made at night, and the sufferer is often unconscious that so great injury has been done to the skin.

Very rarely will the patient recognize that the lesions on the skin are either the result of scratching or connected with or dependent

upon the presence of the lice. They are generally attributed to "bad blood" and to every cause except the right one, and indeed the physician may be often misled in regard to the matter. The correct diagnosis is often embarrassed by the fact that it is frequently difficult to find the offending insects. This is due to the circumstance that they seldom cling to the body, but remain in the underclothing, which may have been changed just before the physician was seen.

From their enormous fecundity and rapid development they would be much more abundant than they commonly are, were it not for the fact that being in the clothing so many are destroyed in washing, as are also many of the nits which are attached to the same.

The body louse has as favorite seats of occupation the shoulders and hips, and here the greatest number of skin lesions will be found. The insects are especially apt to gather around the neck band of the undershirt, and the waist band, and beneath them the lesions from scratching are pretty sure to appear. In making a diagnosis the clothing, particularly in these regions, should be carefully searched on its inner surface with an ordinary magnifying glass, when, with a little care the grayish-white insects may be seen slowly moving about, and their minute white nits may be found attached to the fibres of the underclothing.

Fig. 9.—Proboscis of Pediculus. (After Tilbury Fox and Schjödte.)

The louse is incapable of biting, but obtains its nourishment by means of a proboscis or tube (Fig. 9) which is inserted into the sweat pores, and blood is sucked through their delicate lining. As the insect withdraws its proboscis a minute drop of blood follows, filling the pore and showing externally as a very small dark speck; this forms really as pathognomonic a sign of the trouble as does the furrow in the skin made by the insect in scabies. But some little care is necessary in recognizing this lesion, for frequently very small, scratched papules will give much the same appearance, unless examined very carefully by a glass and by palpation. In the latter, however, there is a slight crust, which is felt by the finger nail passing over it, while the little hemorrhagic specks are on a level with the skin. When the louse has sucked the blood, there is generally some skin irritation around the point of insertion of the proboscis, forming a transitory wheal, which itches and is scratched, but soon subsides. This is thought to be due to some poison which has been inserted by the insect to draw blood to the spot, and in rare

cases there has been known to be produced so much irritation that fever, even up to 104°, has been noticed.

In old and neglected cases, especially in the debilitated, the skin which has been subjected to this repeated irritation and to the scratching has become dry, harsh, thickened, and deeply pigmented, so that much of the surface seems to be the seat of disease. Among tramps and those of filthy habits, the incursion of several varieties of parasites will contribute to form a picture of misery, to which the name of *vagabond's disease* has sometimes been given.

Etiology.—The sole cause of pediculosis is the presence of the pediculi, which come from without and rapidly propagate on the surface: they are, of course, never generated from within the body. A single impregnated female can in a very short time give rise to a large progeny (as mentioned under pediculosis capitis) which can cause very great irritation. On the other hand, even in quite cleanly persons there may remain one or few lice in spite of all precautions, which will keep a slight though continuous irritation, and will be evidenced by few or many scratch marks or torn papules in various parts of the body.

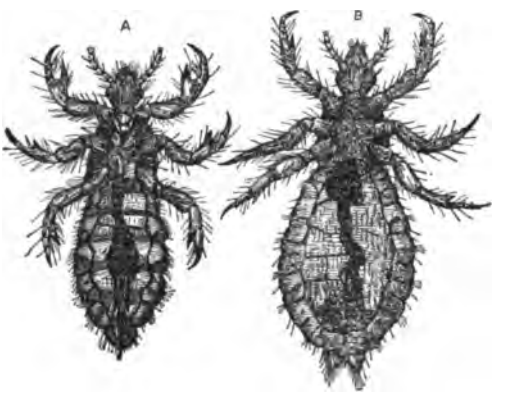

FIG. 10.—Pediculus Corporis. (After Nayler.) A, male; B, female.

Pathology.—The body louse (Fig. 10) is somewhat larger than that on the head, and needs no particular description. It is a small, oblong insect, whitish or gray, streaked with black, with six legs, provided with sharp claws and many hairy bristles. Its movements are slow and it seeks to hide among the folds of the clothing. The nits are smaller than those on the head, and are often very difficult to find, although close examination will sometimes reveal multitudes of them, as small white bodies, attached to the fibres on the inside of the underclothing.

Diagnosis.—Pediculosis of the body may be mistaken for many eruptions: *eczema*, *scabies*, *urticaria*, *pruritus*, *prurigo*, and possibly even some of the lesions of *syphilis;* it may, of course, coexist with these or others. But the peculiar location of most of the lesions about the shoulders and back, and in the region of the waist, should always excite suspicion; indeed, it is always well in itchy conditions in these localities, to surely exclude this condition. A careful ex-

amination will commonly reveal the long scratch marks made by the finger nails, with torn papules and abraded points, and great care will also show the minute hemorrhagic specks already described.

The clothing should always be diligently searched with a glass, both for the insects and for the nits. Inasmuch as the main eruption is generally on the back, this can often be done without the suspicions of the patient being aroused, especially if the clothing is raised above the head, while the patient supposes that the skin only is under inspection. It is needless to say that in private practice the suggestion as to the real cause of the trouble is frequently resented until the evidence is established beyond doubt.

Treatment.—The trouble is very easily remedied when once the diagnosis is absolute. The patient simply takes a warm bath, with plenty of soap, and puts on fresh clothes throughout, and these fresh underclothes should have been thoroughly boiled and ironed with great care. The underclothing which is taken off should receive special attention as to boiling and also ironing, particularly about the seams, with a very hot iron. It is quite possible, however, that there may yet be nits in the fresh clothing put on, they not having been thoroughly destroyed in the wash, so that one must always be prepared for a slight recurrence of the trouble. But a frequent repetition of the process will succeed, provided that the insects have not come from other garments, even the outer clothes. It is sometimes desirable even to iron well the collars of these, and care should also be had as to the bed linen and any articles to which the nits could adhere, as woollen scarfs, etc.

Sometimes there is so much inflammation of the skin as a result of the continued scratching that the patient cannot at once take the needed bath, and it is necessary to treat this dermatitis symptomatically. Carbolized ointment or oil may then be freely used, or perhaps a calamine and zinc lotion with carbolic acid, and the precautions taken in regard to the clothing will suffice to remove largely the cause of the eruption until the full treatment can be carried out. There is of course no need of internal treatment to cure this particular condition; but as lice are more apt to occur and recur on those who are debilitated, it is well to pay due attention to the general condition and health of the patient by hygiene, diet, and proper internal tonics.

(*c*) *Pediculosis Pubis.*

The name given to this form of the trouble is not wholly correct; for in addition to occurring on the pubis this variety of pediculus (known also as the phthirius inguinalis) may in certain cases find its

way to the hair on the abdomen, chest, axillæ, and even to the mustache, whiskers, eyebrows, and lashes, as also downward, the hairs of the legs being sometimes covered with nits. It has likewise been seen, though exceedingly rarely, on the scalp, in infants. Its most common habitat is, however, on the pubis. From its shape the insect has also received the name of *crab-louse*, and the condition of its presence is often popularly spoken of as "*crabs*."

This form of pediculus differs very materially from those previously mentioned in its appearance (to be described later) and in its habits, and is to be looked for in quite a different manner. While the head louse moves lazily around from one hair to another, and the body louse hides in the clothing, this one clings very firmly to one or two hairs close to the skin, and may readily be overlooked, as its yellowish body very closely resembles the skin or a small crust. As it digs into the skin to insert its proboscis in order to obtain nourishment, it excites very considerable itching, and scratched papules result. These may occur much beyond the region occupied by the parasite, and the abdomen and thighs will often be the seat of very considerable excoriations, produced by the patient in efforts to allay the itching. On the other hand, in robust and healthy persons they often give very little trouble, and may be present for months or years without much annoyance.

Etiology.—Pediculus pubis is much more frequently seen in the better walks of life than are either of the two other forms. It is perhaps most frequently acquired during sexual intercourse, but it can come from the clothing, bedding, etc., and also from neglected water-closets. It is the primary cause of the itching, which results in the scratching and the subsequent eruption. There is no question but that the parasite always comes from without, and that there is no possible relation between the condition and any "blood" or venereal disease.

FIG. 11.—Pediculus Pubis. (After Anderson.)

Pathology.—The crab-louse (Fig. 11) is very inactive, and though sometimes it may be seen slowly moving from one hair to another, it is generally found lying close against the skin, from which it is often difficult to raise it, so firmly does the insect cling to the surface and the hair. Its six legs, with strong claws, are placed together, towards the front of the oval or tortoise-shaped body, which is from one-half to one line long; all portions bristle with short rather stiff hairs. Naturalists separate this insect from the others, but under the same order of Hemiptera, giving the name *phthirius* to this, and *pediculus* to the two other forms.

In attempting to remove a pubic louse the insect is found to hold

on to the hair very firmly with its powerful claws, and may be slid along it for some distance before it loosens its hold. The eggs of the pediculus may be seen adhering to the hairs, but they are very much smaller than those of pediculus capitis and often escape attention.

Diagnosis.—Itching in the pubic region should always lead to the suspicion of this form of trouble. The diagnosis will generally lie between it and *eczema*, *scabies*, and *pruritus*. In *scabies* there will be eruptions on the hands or elsewhere marking the disease, and characteristic lesions and furrows on the penis. *Eczema* will commonly present more even surfaces of reddened or thickened tissue. In *pruritus* the itching will generally be about the anus or scrotum, and there will not be the scratched lesions upon the pubis and abdomen. A very close inspection of the parts will demonstrate the parasite, if present, and also the small nits on the hairs (Fig. 12).

FIG. 12.—Nits of Pediculus Pubis. (After Anderson.)

Treatment.—The old treatment with mercurial ointment is certainly very effectual, a few good frictions sufficing, as a rule, to quite destroy the parasites and their nits. But this is not without its drawbacks, as salivation may occur, and also much artificial dermatitis may result. The white precipitate ointment, diluted one-half, is generally sufficient, but acts more slowly. Beta-naphthol, half a drachm to the ounce of ointment, is effectual and cleanly. Oleate of mercury (five per cent.), ʒ vi. with ether, ʒ ij., is recommended by several as a good application, which also kills the nits. When there is much inflammation, soothing ointments and lotions should be used conjointly. After any of these applications bathing will further remove the dead insects and their nits, but no amount of bathing or washing is alone sufficient. It is not desirable to cut the hair.

2. CIMEX LECTULARIUS, OR BEDBUG.

This common pest is too well known to require much description. Like the pediculus it seeks the human skin for nourishment, and in puncturing the skin injects an irritating fluid to increase the hyperæmia of the part. There is a stinging sensation at the seat of puncture, a moderate wheal is formed, and on its subsidence there is more or less of a purpuric spot which gradually fades.

The real habitat of the bedbug is not only the bed and its cover-

ings, but also cracks in the walls and floors, and in chairs, sofas, and cushions or seats in public vehicles. It is a small, flat, brownish-red insect (Fig. 13), sluggish in its movements. When crushed it emits a disgusting odor.

Different individuals differ greatly both as to their susceptibility to attack by these parasites, and also as to the results following their incursions. With some patients a single insect will cause a really intolerable amount of itching and consequent scratching, while others are not much annoyed, even by many of them. Often the cause will not be recognized for a long time, and patients will have very considerable eruption caused by the constant scratching, which will commonly be attributed to "disordered blood," etc., and by long continuance the real cause will be so masked that a diagnosis may be somewhat difficult.

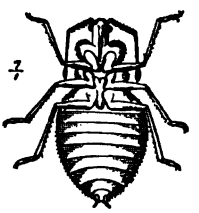

FIG. 13.—Cimex Lectularius. (After Megnin.)

Diagnosis.—The most commonly suspected affection is *urticaria*, to which the wheals produced by the insect have much resemblance. But the lesions from the insects are most commonly seated upon the back parts, while the wheals of urticaria are more apt to be found upon the softer, flexor surfaces, or very generally distributed. It is also common to see several small points grouped together where the insect has traversed a small area. The slightly hemorrhagic zone is likewise rather distinctive, and close observation may generally detect the minute seat of puncture in the centre.

Treatment.—The eruption will mainly cease when the pests are removed, but sometimes the resulting inflammation may require cooling and soothing treatment, and occasionally in cachectic subjects the resulting excoriations or even ecthymatous pustules may require appropriate applications. Spirit of camphor, weak aromatic spirit of ammonia, toilet vinegar, or saturated solution of bicarbonate of sodium will suffice to allay the ordinary irritation caused by the bug. For the complete freeing of the beds, furniture, walls, and floors from the pests, cleanliness and a strong solution of corrosive sublimate are the surest remedies; the latter, of course, should be carefully guarded against misuse and all should be warned of its extremely poisonous character.

3. PULEX IRRITANS, OR FLEA.

This parasite is also a well-known object, and few escape its depredations some time during life. From its very active movements it readily attacks even those most careful as to their personal habits,

and also escapes detection and capture. It exists well-nigh everywhere, but seems more frequent in some localities than in others, and is especially abundant in warm climates; it is readily acquired in public conveyances, and from cats and dogs.

The flea (Fig. 14) is black or, when filled with blood, of a brownish-red color, shiny, with six legs, the hind ones of which are large and powerful, enabling the insect to jump relatively great distances. It lays minute eggs, in cracks in the floor or elsewhere, from which small footless, worm-like larvæ emerge in from six to eight days, remain in this condition about two weeks, and become enclosed in a cocoon, from which the insect emerges in about the same length of time. Only after the flea has undergone its metamorphosis into the fully mature insect does it again seek the human skin for nutrition.

FIG. 14. — Pulex Irritans. Common flea.

The amount of irritation produced by fleas may be very considerable, but it is rather short-lived, and seldom are there such inflammatory results from scratching as are seen in connection with the parasites previously mentioned. The stinging sensation at the moment of puncture is quite perceptible, but is generally relieved by a slight scratching. A small, slightly raised red spot or wheal is formed, which leaves a reddish areola for some time after its subsidence, in the centre of which a minute punctum can generally be seen. The bites of fleas are generally in groups, or often in a line along which the insect has advanced. *Urticaria* is generally suspected, or sometimes the lesions are so scratched as to resemble a papular eczema. The softer surfaces, as about the ankles, are very common places to be attacked.

The *treatment* is the same as that recommended for the last-mentioned parasite.

4. IXODES, OR WOOD TICK.

There are many varieties of tick or wood louse, found in various parts of the earth, which may at times attack the human skin: the white-spotted tick, *ixodes albipictus* is said to be the best known in this country. The *ixodes bovis*, or common cattle tick of the Western States, is closely allied to the *ixodes ricinus*, well known in Europe and temperate regions. They are small air-breathing insects which generally remain on trees and bushes, and occasionally light on the skin to secure blood. Their process of attack is much the same as that of the pediculi—namely, the insertion of the proboscis into a follicle of the skin. There is this difference, however: while the pediculus extracts blood and leaves the skin readily, the

wood tick adheres so strongly by means of its hooklets that it is impossible to remove the animal until it is quite satisfied. During the process the body swells to many times its natural size, even to that of a small pea, and it may remain attached for several days.

The injury inflicted by the tick is hardly noticed at first, but the sensation becomes troublesome as the animal is gorged; there is something of a wheal produced at the time, and some little inflammation may remain. If the attempt is made to remove it forcibly, the proboscis is broken off in the skin and pain and inflammation may ensue.

Fig. 15.—Ixodes Ricinus. Wood tick.

The animal is easily made to release its hold by the application of a drop of turpentine or benzin or any of the essential oils, as anise, rosemary, etc. Tobacco has also the same effect. Later irritative effects should be treated by cooling or soothing applications as in other forms of dermatitis.

5. Dermanyssus Avium and Gallinæ, or Bird and Fowl Mites.

These frequent parasites of fowls and birds will occasionally attack the human skin, and cause considerable eczematous inflammation, largely due to the scratching induced by the irritation.

These insects are very small, grayish-white, like a grain of sand, with eight legs, and are very active. They are soft, easily crushed, and are said to have no eyes. They are provided, both male and female, with a sharp sting-like proboscis by means of which blood is extracted. They are sometimes a very great pest among fowls and doves, and when abundant are prone to get upon those who care for the fowls.

Fig. 16.—Dermanyssus Avium. (After Küchenmeister.)

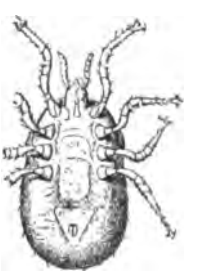

Fig. 17.—Dermanyssus Gallinæ: impregnated female, ventral surface. (After Megnin.)

When long unrecognized a very considerable amount of cutaneous irritation may be produced by scratching, which will generally subside easily on the cessation of the cause. The treatment would be that referred to in connection with other animal parasites.

6. Culicidæ, Simulidæ, Tabanidæ, or Mosquitos, Gnats, Midges, and Flies.

The mosquito (*culex anxifer*), like other insects attacking the human skin for nourishment, affects different persons very differently. While some bear their depredations with very little inconvenience, with others each sting will produce a wheal, with much stinging and burning pain, and in rare instances almost an erysipelatous inflammation will be excited. Infants and children will often present a very considerable eruption about any parts which may have been exposed, largely, of course, from the consequent scratching. The mosquito is believed to be the means of completing the transformation of the *filaria sanguinis hominis* in certain warm countries, as mentioned later in connection with that parasite.

Gnats (*culex pipiens*) are also capable at times of exciting very severe inflammation of the skin, and during certain seasons prove a great pest to those much in the woods. Also certain species of flies (*simulium molestum*, and *s. columbaczense*, *tabanus bovinus*) are capable of exciting much inflammation by their sting. Other species of flies (*œstrus*) which do harm by their larvæ will be mentioned later.

The main interest in dermatology is in regard to the *diagnosis*, for not infrequently the lesions caused by these as well as by other insects attacking the skin will be attributed to systemic conditions. The fact of the eruption being situated on exposed parts, and the character of the lesions, urticarial-like, leaving often a slight purplish halo, with generally a small puncture in the centre, are generally sufficient to establish this with certainty.

The *treatment* consists in cooling lotions, such as that of calamine and zinc, with an extra amount of carbolic acid; tincture of camphor sopped lightly on, or weakened aromatic spirit of ammonia, or diluted vinegar—all serve to relieve the sting. Menthol and oil of eucalyptus, about two per cent. in liquid albolene or sweet almond oil, will be of service in protecting against the attacks of gnats and midges.

7. Apes, Vespidæ, Araneina, etc., or Bees, Wasps, Spiders, etc.

Bees and wasps attack the human skin not for the purpose of securing nutrition but to inflict injury, in self defence. Their sting may at times prove very severe, and many instances are on record where death has resulted from their savage attacks. Very considerable pain, and often much swelling, commonly result from a

single sting, which may persist for some time. Sugar of lead water on absorbent cotton is a good application, but common garden earth moistened and laid thickly over the part probably gives as much relief as any other application.

Spiders also often inflict very severe injury, some of them being capable of injecting a very acrid poison. The *tarantula* of warm climates is well known for the severity of its bite or sting.

Some species of ants and caterpillars also attack the human skin and inflict more or less painful lesions, characterized by redness and swelling and some stinging and burning pain. It is reported that in some districts in Switzerland there is an *epidemic urticaria*, of very severe character, caused by a certain species of caterpillars.

8. Hirudo, or Leech.

The parasitic nature of the leech is, as is well known, put to valuable use in medicine. The bite inflicted by the variety which is introduced for this purpose is harmless, and the wound heals shortly and kindly. But there are species of the hirudo that at times attack those in the water so severely that much harm may result, and there are some varieties in tropical countries which by their poisonous bite inflict wounds that may suppurate, and may even endanger life.

II. By Animal Parasites Penetrating the Skin, either Themselves or Their Larvæ.

1. Scabies.

Synonyms.—The itch; Fr., *Gale;* Ger., *Krätze.*

Scabies is not a very common affection in this country, it forming 4.05 per cent. among about two hundred thousand skin cases collected by the American Dermatological Association. It is very much more common in Europe, and is brought to this country continually by immigrants, and is consequently more frequently met with in the seaboard cities. It is most prevalent among the poor and those neglectful of cleanliness, but is also constantly met with in private practice among all classes. It formed a little less than one per cent. among ten thousand miscellaneous skin cases in the writer's private practice.

The eruption of scabies is due primarily to the boring beneath the skin of a minute insect, the *sarcoptes* or *acarus scabiei.* Certain lesions, to be described, are thus caused, and certain others, often by far the most prominent, are caused by the scratching which is undertaken to relieve the itching; and sometimes there will be considerable artificial dermatitis excited by the treatment employed.

The eruption in scabies is peculiarly multiform. Papules, vesicles, and pustules (the latter being sometimes ecthymatous and of some size), also scratch marks and crusts, may each or all be present in any one case, according to its duration and the condition of the individual in regard to health, cleanliness, etc.

On the other hand, in mild cases or at the beginning of the eruption, there may be very few lesions, mainly the great itching, with a few torn papules or vesicles in certain places. But, however great or little the eruption, there are features which belong to the disease which should be sufficient to establish the diagnosis if sufficient care and thought are given.

There is one pathognomonic sign which, if present, establishes the nature of the disease, and that is the *cuniculus* or furrow in the skin (Fr., *Sillon;* Ger., *Milbengang*) made by the female insect in the course of depositing her eggs. This little track which the female leaves consists of a minute, brownish-black line, more or less dotted, which appears as though a bit of fine, dark-colored sewing silk had been run just beneath the surface. These delicate lines are generally curved or sinuous, and vary in length, commonly from an eighth to a quarter or half an inch, but occasionally they are longer, and may even reach several inches. If the skin is washed or wiped clean over them, instead of being removed they will stand out still more distinctly; this distinctness may be accentuated by first rubbing a little ink over the part before washing, which will sink into the furrows and stain them darker. From experiments by Bourgingnon and Gras, on their own persons, it was found that the female enters the skin almost immediately, and within twenty-four hours will have made a burrow half a line in length, and may advance a line a day.

The eruption of scabies also presents peculiarities of location which are characteristic. The parasite gains entrance in most cases upon the hands (although undoubtedly other regions may be first invaded), and the earliest lesions are commonly found between the fingers and on the flexor surface of the wrist. In children the furrows and vesicles and pustules are frequent upon the palms. From the necessary contact with the hand in urination, the penis is generally infected early in the disease, and here may be found some of the most exquisite examples of the *cuniculus*. From the irritation about the genital region there often occurs a considerable eruption upon the abdomen and thighs, which may be the seat of abundant scratched papules. The anterior fold of the axilla is a common site for the eruption in both sexes. In females the region of the nipples is early the seat of eruption.

In both sexes the parasite is also apt to attack parts where there

are warmth and pressure, as, about the waist and the buttocks, especially in those who sit much, and also on the extensor surface of the elbows. In children the soft region about the ankles, and also the toes and soles, are commonly affected, and these regions are sometimes affected in women, and also in men when the disease has lasted long. The face and head generally escape from all lesions.

The itching of scabies begins with the first attack of the female burrowing insect. It is then but a slight tickling; this gradually increases as she penetrates the deeper layers and as new insects burrow, and the consequent scratching gives rise to inflammatory lesions which are both painful and which itch in turn. So the disease increases until in certain cases the suffering, which is always worse when the patient is warm in bed, may become almost intolerable. In the main, however, it is more bearable than the itching of eczema or some other pruritic conditions.

In aggravated cases, where the disease has long existed, a large portion of the body may become the seat of an inflammatory dermatitis from the combined irritation of the parasites and the scratching, and considerable crusts may form, which in turn become the nests of fresh broods of the parasites. When this condition is long neglected in persons of filthy habits, this accumulation of débris may be very great; such cases are sometimes seen abroad, and to this has been applied the name *scabies Norvegica*, as seen in Norway.

Etiology.—The sole cause for the eruption is the presence of the parasite, *sarcoptes scabiei*, which is always introduced from without. While it is often difficult to ascertain the exact time when the disease was acquired or the method, there is generally a history of contagion from others affected. The simple contact of hand-shaking or brief contact is not commonly sufficient to transfer the parasite, or the disease would be more frequent. Physicians and students will frequently examine cases minutely and even for a long time, and cases in them are almost unknown. It is undoubtedly often conveyed during sleep, and perhaps quite as often by the use of towels as in any other way. After the disease has been cured it is sometimes again acquired from gloves which have been previously worn, also from muffs and articles of clothing.

No age, sex, or condition is free from the liability to scabies, although it is most common among children and young adults, especially of the poorer classes.

During the late Civil War it was exceedingly prevalent among the soldiers, and was often spoken of as the "*army itch*," which, however, does not appear to have been in any way different from the disease under consideration.

Pathology.—The eruption produced by the parasite and by the accompanying scratching is a dermatitis, or simple inflammation of the skin; this may occur in any one, irrespective of any condition of the system, and is akin to that excited by heat, cold, or any external irritant, which will vary according to the irritability of the skin. In those who are subject to the eczematous habit, patches of eczema may result, and in those in a cachectic condition the inflammation may become great and ulcerations may occur. When micro-organisms enter the abraded surface pustular lesions result.

The furrow caused by the burrowing parasite is generally associated with a papule which is transformed into a vesicle, which in turn may become a pustule. Commonly this will be at the end of the furrow, where the insect has penetrated deepest to obtain nourishment from the succulent rete Malpighii. Sometimes the furrow will pass beyond this and may be traced over its surface. At the distal extremity of the furrow is found the female insect, with the head pointing downwards, and here she remains until she dies or is removed by scratching. Behind her, in the furrow, will be found eggs, varying in number according to the length of time she has been left undisturbed, with small black particles between, which are fæces. These eggs are in various stages of development, those nearest the orifice being almost fully formed. The female is said to live about two months after burrowing. The eggs hatch out in from five to fourteen days, and the insects are soon in perfectly formed condition; the females become impregnated and immediately burrow again to deposit their eggs. The male takes but little part in the production of the eruption; he lives on the surface or burrows slightly for protection.

FIG. 18.—Cuniculus of Scabies, showing acarus at end of furrow, with eggs behind in the furrow. (After Neumann.)

Under favorable circumstances, with a strong lens the female may be seen as a very small white dot at the distal end of the furrow, and may be extracted by opening it up carefully with a needle. When removed she appears as a minute white speck, just visible to the naked eye on the point of the needle, and may be mounted for microscopical study on a slide, either dry or placed in diluted Canada balsam for preservation (Fig. 19, *A*, *B*, *C*).

Under the microscope, enlarged one hundred diameters, the parasite appears as a tortoise-like insect, with a short projecting head and eight legs. The four anterior legs have suckers upon them, the posterior ones have bristles. The male is much smaller than the female and has suckers also on two of the hind legs. The young animal has at first only six legs, and is complete only after it has shed its coat two or three times.

Diagnosis.—In many cases the diagnosis of scabies is easy, but again, in very cleanly persons and where there is relatively little eruption, it may be extremely difficult. Where well-defined and characteristic *cuniculi* are present the nature of the trouble may be regarded as certain. But even in these there is liability to mistake; the edges of ruptured vesicles will sometimes so simulate the furrows that

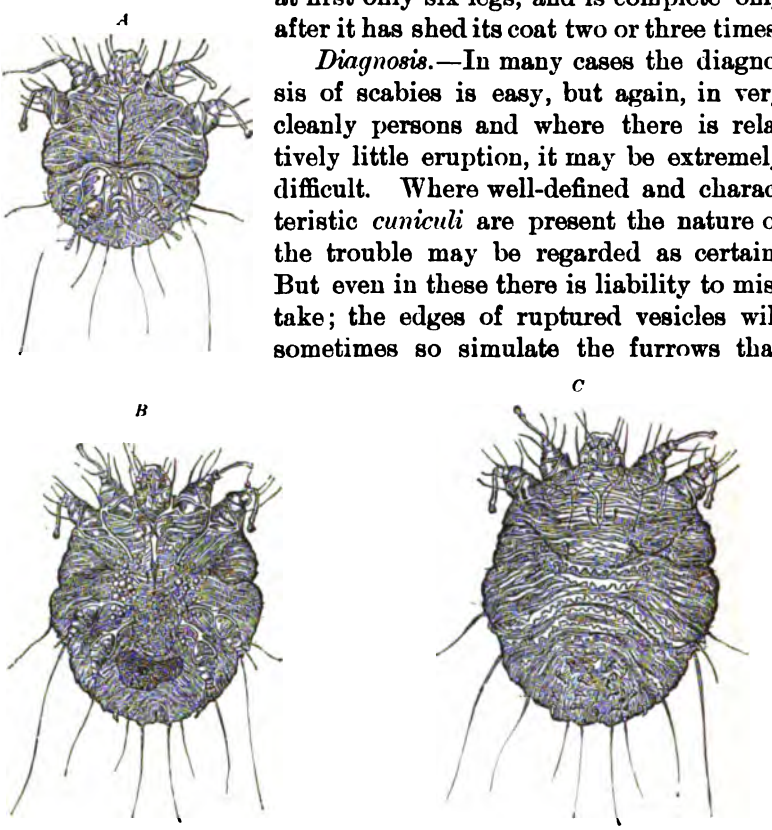

FIG. 19.—Acarus (sarcoptes) Scabiei. (After Neumann.) *A*. Male acarus, ventral surface. *B*. Female (impregnated) acarus, ventral surface. *C*. Female acarus, dorsal surface (enlarged).

only after patient study and washing of the part can their nature be determined.

The eruption present may be confounded with *eczema*, *lichen*, *pediculosis*, *prurigo*, *pruritus*, and *urticaria papulosa*. The polymorphous character of the eruption and the location of the lesions should always suffice to excite suspicion, and the recognition or exclusion of features belonging to other eruptions should establish the correct diagnosis. Between papular and vesicular *eczema* of the hands and mild, recent scabies, the diagnosis is often very difficult.

Not infrequently in cleanly persons the parasite gets very little opportunity to burrow, and in those of delicate skins there is a papule or vesicle formed immediately when it penetrates the skin. In doubtful cases it is well to search carefully with a lens all the places mentioned where the lesions are apt to appear, and to try to extract the animal from the very short furrow which may exist in such cases.

Treatment.—Scabies being purely a local affection, its cure is effected by local measures which destroy the parasite. But in determining the proper treatment for any case due regard should be had for the age and sex of the patient, as well as the condition of the skin, as to its sensitiveness and the amount of artificial eruption present. While the purpose is to destroy the parasite, care must be had not to irritate the skin too much; on the other hand, ineffectual treatment, by only mild and soothing measures, will never reach the real source of trouble, and the parasite, remaining in its burrow, will reproduce the eruption. Moreover, even after the patient seems to be cured, it is quite possible that utter destruction of every acarus may not have been secured, and a single impregnated insect can reproduce the disease. It is also to be remembered that in some cases of scabies the skin may be so severely irritated by the measures used for the destruction of the parasite that an artificial papular eruption results, which more or less imitates the original disease.

The aim of the treatment is to open the furrows and dislodge and kill the parasite and the eggs; at the same time it should allay the irritation of the skin and heal the results of scratching. As an indication of the general plan to be followed we may mention the rapid cure of the disease as practised on out-patients in the Hôpital St. Louis, Paris. The patient is first thoroughly rubbed all over from head to foot with soft soap, especial attention being paid to the regions most affected; this process occupies about half an hour. The patient then takes a warm bath, remaining in it for half an hour or so, in the mean time scouring the skin actively. On coming out of the bath, after drying, he is thoroughly rubbed from head to foot with an appropriate ointment containing sulphur, and this process also takes half an hour or more, particular attention being given to the portions mentioned as most commonly affected. The clothes, which have been thoroughly baked while the patient was undergoing treatment, are now put on (considerable ointment being left on the skin), and it is expected that the disease is entirely cured. In fact, however, this is not the case, in a certain proportion of instances at least; for the disease exists very largely in Paris, and undoubtedly many of the same patients return at later dates when new acari have hatched out. It would be very difficult in one such treatment surely to destroy and

remove every insect and egg, which are often deeply embedded in the skin. But a repetition of the course, one or more times, can surely accomplish the result.

The idea of this procedure is that upon which all treatment should be based, although modified to suit the individual case. The first friction with green soap opens the furrows as far as possible, and dislodges the eggs which would hatch out; these with the male insect, which would be thus reached, are removed from the skin by the bath. The gritty ointment, with sulphur, being then well rubbed in, breaks up the remains of the furrows; or penetrating, completes the destruction of the parasites. The clothes having been baked at a high temperature, all the insects or eggs which may have lodged in them are destroyed, and the patient going home with the ointment still on, the parasiticidal action of the latter is continued for a much longer time.

As intimated above, all skins would not stand quite such harsh treatment, and the process must be modified somewhat as occasion requires. But to be successful the treatment must be carried out on the lines indicated.

When there is not a very great deal of inflammatory eruption from scratching, and the skin seems resistant, the modified Wilkinson's ointment, long used by Hebra, is good:

℞ Sulphuris sublimati,			
Olei cadini, ...	ää	ʒ ij.	7.77
Cretæ præparatæ, ...		ʒ iiss.	9.71
Saponis viridis,			
Adipis, ...	ää	℥ i.	31.10
M.			

But this is rather stimulating for most skins in this country, and the irritating effects of the sulphur may be modified by styrax, as in the following formula:

℞ Styracis liquidæ,			
Sulphuris sublimati, ...	ää	ʒ i.	4.00
Adipis purificati, ...		℥ i.	31.10
M.			

When still milder applications are needed, naphthol serves very well as a parasiticide, and the following combination advocated by Kaposi and Crocker answers excellently:

℞ Naphthol, ...	ʒ iv.	15.00
Cretæ præparatæ, ...	ʒ iij.	10.00
Saponis viridis, ...	℥ iss.	50.00
Adipis purificati, ...	℥ iij.	100.00
M.		

This is also an agreeable application, as it is white, and has little odor. There is no objection to adding to any of these ointments one per cent. of almost any of the essential oils, lavender, bergamot, or geranium, for they rather increase the efficacy of the parasiticide, but in some cases they may prove irritating to an inflamed or delicate skin. It is well also to add a little carbolic acid, say one to two per cent.

When there is much itching and inflammation, it is often desirable to add some preparation of tar, and the following will be found serviceable:

℞ Ichthyol,		ʒ ss.	2.00
Potass. carbonat.,		ʒ ss.	2.00
Sulphuris sublimat.,		ʒ ij.	7.77
Unguent. picis,		ʒ ij.	7.77
Unguent. aquæ rosæ,		ʒ vi.	23.31

M.

It is always to be remembered that the skin may itch and be inflamed by scratching even after the parasite has been destroyed; and care must be taken not to push the antiparasitic treatment too strongly, nor too long after there is a reasonable expectation that this has been accomplished. Cases are continually met with where this has occurred; the papular eruption being, of course, just in the locations where the previous parasitic lesions have been, the treatment is often continued long after it is needed and it may, and in fact does, produce and keep up the new eruption.

About three good cycles of treatment as described, should destroy the parasite. It is well then to wait a few days and observe the results; if there is need of it, a soothing treatment suitable for eczema may be employed, including alkaline baths, inunction with carbolized vaseline, etc. A careful examination of the case will then determine if further antiparasitic treatment is necessary.

The possibility of reinfection should never be forgotten; the patient's clothes should receive particular attention, and extra heat should be applied in boiling and ironing the underclothing, and in ironing or disinfecting that worn outside. Other possible sources of fresh contagion should be looked into, as gloves, mittens, muffs, bedding, etc. All the members of a family, or those associated together, who have the disease, should also be treated at the same time, otherwise it may be prolonged indefinitely, as has sometimes been the case in families, schools, prisons, etc.

Prognosis.—This is, of course, always good, however long-standing the case, if the diagnosis is absolute and proper treatment is effi-

ciently employed. The system is never affected, and there is no harm in curing the disease as quickly as possible. The duration of complete cure may vary from a few days to several weeks.

Sarcoptes Scabiei Communis.

According to Küchenmeister and Megnin the parasite commonly found in man, causing the eruption to which the preceding description relates, is only one of quite a large variety of those insects which infect other animals. The cat, dog, cow, pig, horse, fox, wolf, goat, camel, sheep, etc., all are subject to the attack of similar parasites (Fig. 20), which differ somewhat from each other. These may occasionally attack man and excite an eruption more or less similar to that described. But this is of rare occurrence, and it is stated that they cannot go through their transformations and live permanently on the human skin, but that spontaneous recovery will occur in six or

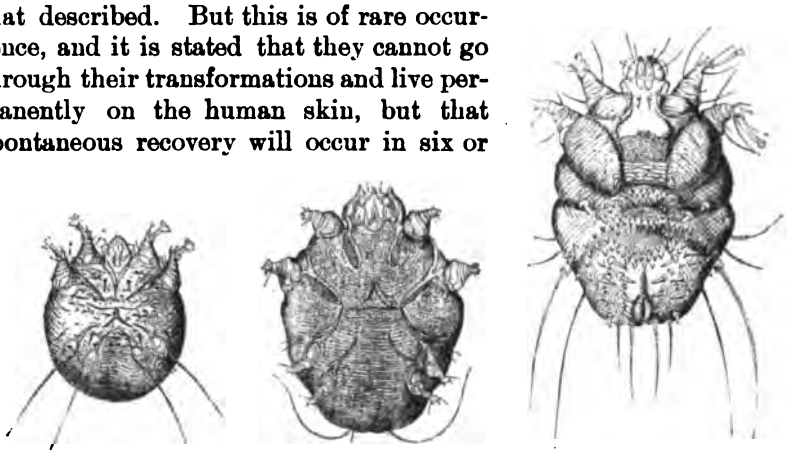

Fig. 20.

Sarcoptes (of mouse). (After Megnin.)

Sarcoptes Mutans. (After Megnin.)

Sarcoptes (of horse). (After Megnin.)

eight weeks. Repeated fresh invasions of the parasites can, however, keep up the disease indefinitely. The treatment would be the same as that already given for scabies.

2. Leptus Autumnalis, or Harvest Bug.

There are several varieties of insects which may be described under this head, which, in their larval state, attack the human skin and bury themselves in it, to a greater or less extent, in search of nourishment. The most common is a minute reddish mite (Fig. 21), much larger than the scabies insect, and plainly visible to the naked

eye when it has attacked the skin. It has six legs with claws and a short thick-set head with strong mandibles.

Its attacks are confined almost wholly to the hot season during July and August. Its true character is not exactly known, but it is recognized as a larval state of another insect, which has its habitat near the ground among low bushes, and it does not breed upon the skin. It attacks man quite accidentally as he passes its location, and is generally found first on the legs and ankles, but may appear elsewhere.

FIG. 21.—Leptus Autumnalis. (After Küchenmeister.)

The animal does not penetrate fully into the skin, but bores its head far enough to obtain nourishment, and remains in position until removed by friction or otherwise. The seat of its puncture becomes first a papule, then a wheal, in the centre of which may be detected the brick-red body of the insect. Later, if scratching is indulged in there may be various forms of artificial dermatitis, as in other forms of parasitic disease.

Megnin describes, under the French name *rouget*, a larva of the *trombidium holosericeum*, which is especially troublesome in the west of France, where it is known as Aoûtat, Aoûti, Vendangeur, etc. The eruption has also been called *erythème autumnale*, and *prurigo du rouget*. The insects attach themselves at the base of the hair follicles, as many as a dozen having been found encircling a single hair; they also penetrate the sweat and sebaceous glands. The irritation caused thereby may be excessive, and papules and vesicles may be formed.

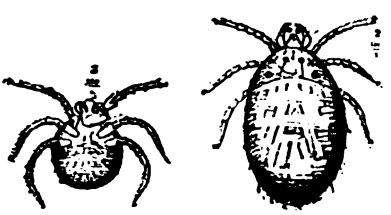

FIG. 22.

Rouget, before feeding. (After Megnin.) Rouget, after feeding. (After Megnin.)

The larva (Fig. 22) has six legs and is of a reddish-orange color. It has a round or oval body with a short conical head, with two strong mandibles at the sides, which are planted firmly in the skin; as it abstracts blood the body swells to five times the size it had on emerging from its egg.

Geber has described as *acarus hordei* another minute larval condition of a mite which frequents barley (Fig. 23) and is apt to annoy the reapers and those who handle the grain. It is of an oblong-oval form, yellowish-white, with four pairs of feet, the first pair of which terminate in a hooked claw, the others in suckers. The head is large and provided with a boring apparatus.

The entrance of the mite into the orifice of the follicle gives rise to an urticarial wheal, and when the skin is irritable considerable eczematous dermatitis may follow from scratching. The insects may be found, by raising the skin with a needle, around one of the affected follicles. The insects do not breed in the skin, and soon perish.

Fig. 23.—Acarus Hordei. (After Geber.)

There are probably also other varieties of the same or similar insects or their larvæ which could be included under this heading; occasional reports are given of such, but not with sufficient clearness to admit of accurate statement.

The *treatment* of the eruption thus produced is very simple. Very little is required to kill any of the parasites which may yet be burrowing into the skin; naphthol, or mild sulphur ointment, or a weak mercury ointment is quite sufficient, and the skin irritation may be relieved by calamine and zinc lotion or any mild astringent ointment. If the bodies of the insects seem to remain in the skin, it may be best sometimes to pick them out with a needle.

3. Pulex Penetrans, or Jigger.

This insect, which belongs to the same genus (*Aphaniptera*) as the common flea, is quite different in its character and mode of attack on the human skin. Its proper name is *sarcopsylla*, known also as *chigoe*, or *chique*, which is corrupted to "*jigger;*" it is also popularly known as "*sand flea.*" It is indigenous to South America, but is occasionally seen in patients who have been in the Southern United States.

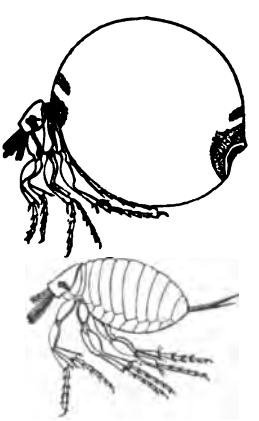

Fig. 24.—Pulex Penetrans Before and After Feeding. (After Leuckhardt.)

The male is said to live in the sand, and the impregnated female only to attack the human skin, which she penetrates for the purpose of ovulation. There is little pain or sensation at first, but as she becomes distended with eggs there is a distinct swelling which becomes painful, and if the matter is not attended to ulceration occurs, which may prove of serious character. This is especially the case if the eggs have been extruded beneath the skin, either naturally or by rupture during efforts at extraction. The most common site of attack is on the feet, especially beneath or by the sides of the nails, but it has been found in many parts of the body.

The sand flea (Fig. 24) is a very small, egg-shaped insect, hardly half the size of an ordinary flea; it is of a brownish-red color, and so tough that it can with difficulty be crushed; it has a proboscis which is as long as its body. When distended with eggs the body may become the size of a small pea, and is of a whitish color, while at each pole there is a small red spot, which represents either extremity of the animal.

The *treatment* varies somewhat with the stage of the complaint. When the insect has just entered the skin the opening may be followed up with a needle dipped in carbolic acid. When the animal has become distended, and the white swelling or vesicle is seen, greater care must be taken lest its body be ruptured and the ova left in the wound, and a red-hot needle or the galvano-cautery may be needed. When the sores are larger, if they do not yield to disinfectants, and especially to pure carbolic acid wiped in the wound by means of cotton on a bit of wood, they may have to be thoroughly curetted, and treated as any other fresh wound.

Prophylaxis consists in wearing proper foot covering, in great cleanliness, and in putting some of the essential oils, such as anise, rosemary, etc., or turpentine or carbolized oil, on the feet or stockings.

4. Demodex Folliculorum, or Comedo Mite.

This parasite differs from those which have been described, in that, although not very uncommonly present in the contents of dilated sebaceous glands in man, its presence produces no disease nor even causes any inconvenience. In dogs it has been known to excite a follicular eruption, and cowhides have been found seriously damaged by the parasite; in some samples as many as eight or ten pits, some of which penetrated nearly through the skin, were found within the area of one square inch. Each of these pits was filled with a fatty substance containing multitudes of parasites. Similar injury to the skin of hogs has also been reported.

In man the demodex is said not to exist in the skin of the newborn, but has been found as early as two years of age and probably exists in the skin of every adult, although often difficult to find. Its favorite sites are the nose, chin, forehead, cheeks, etc., but it has been observed on many parts of the body. Sections of the skin, containing plugs in the glands, show that the parasite rests with its head downwards in the follicle; the number in each cavity may vary greatly, often there being but a single one, while over a dozen have been found within one gland. It may be easiest obtained by expressing the contents of the enlarged glands of the nose, or by scraping

the surface of a greasy skin firmly with a dull knife. The matter so obtained is rubbed up with a little oil or glycerin and examined with a magnifying power of three hundred or four hundred diameters.

The *demodex* (known also as the *acarus* or *steatozoön folliculorum*) is an exceedingly minute, worm-like body (Fig. 25) with well-marked head, thorax, and abdomen. The head is provided with scissor-like mandibles; the thorax carries four pairs of short legs; the abdomen is long and tapering like the finger of a glove. Both males and females are found in the glands, and the animal is believed to be oviparous; they are very sluggish in their movements. Little if anything is known as to their origin, how they exist outside of the body, or in what manner they gain access to the sebaceous glands.

FIG. 25.—Demodex (Acarus) Folliculorum. (After Anderson.)

As before remarked, these parasites are not known to have any injurious effect on man, and it is not thought that their presence is in any way connected with the occurrence of acne. No treatment, therefore, is ever required for them.

5. DRACUNCULUS (FILARIA) MEDINENSIS, OR GUINEA-WORM.

This parasite is rarely seen in this country, but is very common and at times almost epidemic in some tropical parts of Asia and Africa. It has been met with also in several of the West Indian islands, and in South Carolina, and cases have been reported elsewhere in this country. Inasmuch, however, as it is believed that from nine to eighteen months may elapse after the worm enters the body before it appears beneath the skin, it is occasionally seen in those who have returned from tropical regions.

The worm does not cause any disturbance until it has reached the skin, which it does when about ready to produce its young; there is then a soft mass felt beneath the surface, which may move from place to place, before the skin over it actually becomes inflamed. When ready to make its exit, the skin bulges out more, with a feeling of tenseness, and gradually becomes red and painful, with slight fluctuation. If left alone a small perforation takes place, through which the white head of the worm appears, and under very favorable circumstances may come out with its young, and the wound closes. More commonly the worm remains in the wound and may be either

broken off or killed in attempts at extraction, and as a result severe and prolonged ulceration may ensue.

Very frequently there is but a single worm, but as many as fifty have been observed in one individual. The most common place for exit of the parasite is in the foot, in two-thirds of the cases, and, in a large share of the remainder, about the lower legs and thighs; it has, however, been observed to come out on almost every part of the body.

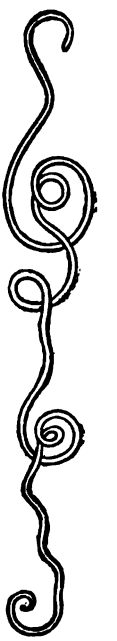

Fig. 26. — Dracunculus (or Filaria) Medinensis.

The impregnated female alone is the cause of the trouble, to which the name *dracontiasis* has been given. It is thought by some that the animal is an hermaphrodite, as no males have ever been discovered. The full-sized worm, as found in the cases described, is of a milkwhite color, is seldom less than a foot in length, more commonly about twenty inches, and may be even several feet long. It is thread-like, of uniformly cylindrical shape, is from one-fifteenth to one-tenth of an inch in diameter, with a curved and pointed tail and a convex head, with a small triangular mouth-opening, surrounded by four small papillæ. It is viviparous, and the young—which, unlike the parent, are provided with a long tail—live free in water. It was formerly believed, from the frequency with which the feet and legs were attacked by this parasite, that the embryo entered the skin directly from the water. But it has been proved that the larva bores its way into the body of a cyclops and there undergoes further development; it is probable that the parasite is then transferred to the alimentary canal of man by means of drinking-water; the larvæ escape, develop sexually and become impregnated somewhere in the system, and the impregnated female is possibly carried to its destination by means of the blood-vessels, as in the case of the next to be described parasite. Some think that she penetrates the muscles for further development, causing localized pain in them, and finally reaches the skin of the feet in order to discharge her young at the point nearest the ground.

The *diagnosis* is often a difficult one to make until the tumor has fully formed, indeed until it has opened and the head of the worm presents.

The *treatment* is very tedious and far from satisfactory. If the attempt is made to open the swelling before the worm is ready, it will be found very difficult to extract the parasite entire. When the opening has occurred and the head protruded, it is wound about a bit of stick and gradually drawn out, the process sometimes lasting

for days or weeks. In India the natives extract it by means of a tube a foot in length, with mouth suction, which could be well done by an aspirator. If broken off in the wound violent inflammation may ensue. Asafœtida, a drachm or two of the tincture internally three times a day, has been recommended highly, as has also asafœtida in poultices.

6. Filaria Sanguinis Hominis.

Recent researches have demonstrated that this parasite is sometimes the cause of lymph scrotum and of certain forms of elephantiasis, whose clinical features are considered elsewhere in this work. It is stated that in China the parasite occurs in all these cases. The subject has been very carefully studied by Wucherer, Lewis, Bancroft, and Manson.

The parent worm is "a long, slender, hair-like animal, quite three inches in length but only one-hundredth of an inch in diameter, of an opaline appearance, looking, as it lies in the tissues, like a delicate thread of catgut animated and wriggling." "The male worm is smaller and has been only occasionally found. The female produces an extraordinary number of embryos which enter the blood current through the lymphatics. Each embryo is within its shell, which is elongated, scarcely perceptible, and in no way impedes its movements. They are about the ninetieth part of an inch in length and the diameter of a red blood corpuscle in thickness, so that they readily pass through the capillaries. They move with the greatest activity, and form very striking and readily recognized objects in a blood drop under the microscope." In the daytime they cannot be found, but in typical cases they are present at night in large numbers.

Fig. 27.—Filaria Sanguinis Hominis.

Manson believes that the parent worms live in the lymphatic trunks, and discharge their ova into the lymph stream, whence they reach the blood through the thoracic duct. If the ova are fully developed they readily pass the glands. He has shown, however, that the ova, before discharge, are considerably shorter and thicker than the full-grown embryos, measuring from $\frac{1}{300}$ to $\frac{1}{750}$ of an inch, far too large to pass through lymph spaces in the glands. A premature discharge of ova, therefore, before they were quite ready to be hatched, would block the lymph glands, and so lead to stasis and consequent lymphatic swelling and hypertrophy of tissue.

The mosquito is believed to be the means of securing the necessary transformation of this parasite. It imbibes the embryo filariæ

with the blood at night, and many of the latter attain their full development within the mosquito. As the latter resorts to water to deposit its eggs, it frequently dies there, and the filariæ become freed, and are again introduced into the human system by means of the water.

It was originally thought that this filaria was confined to Asia, but recent writers have shown it to prevail extensively in the Southern United States, and it is probably very widely distributed.

7. Craw-Craw.

This name is given by the natives of the west coast of Africa to an eruption which appears much like an old scabies. According to O'Neill it is said to be caused by the presence in the skin of a very small nematode, or worm-like parasite, more or less related to those just considered. What is thought to be the same eruption has also been observed in Brazil by Aranjo, and in France by Nielly.

Fig. 28.—Filaria from Craw-Craw. (After Nielly.)

The eruption attacks the hands, forearms, and arms, the feet and legs, and may appear on the trunk. It is attended with very great itching and papules, vesicles, and pustules appear, much as in scabies. The papules develop into vesicles very speedily, and in a couple of days pustules are formed which unite with others in the neighborhood. Following the scratching there are the usual signs of dermatitis, with much crusting. It is very contagious.

Fig. 29.—Filaria found in Vesicles in Craw-Craw. (After O'Neill.)

The parasite (Figs. 28 and 29) is found by the microscope beneath the crusts, on removing the covering of the vesicles, and in the sero-purulent fluid expressed from them. It is a minute thread like animal, $\frac{1}{125}$ of an inch long by $\frac{1}{2500}$ wide, differing from the filaria in being shorter and broader, and having two distinctive black marks near the head.

The *diagnosis* of the eruption would be very difficult. It would be distinguished from scabies by the absence of cuniculi or of the acari in the skin.

Little is known as to its *treatment*, but sulphur is said to be of doubtful efficacy, while the native treatment frequently fails even after

six months' employment. The eruption improves on removal of the patient to a cool climate, but recurs when he returns to the tropics.

Crocker is inclined to think that different eruptions have passed under the name of craw-craw, but the condition here described is that to which the name properly belongs.

8. Cysticercus Cellulosæ.

The cysticercus, which is common in animals, especially in the pig, is occasionally seen in man, where it may affect the subcutaneous tissue (Fig. 30) as well as the muscle, brain, spinal cord, eye, etc. Its manifestations beneath the skin produce more or less numerous oval or roundish, projecting tumors, varying in size from a pea up to that of a walnut, occurring chiefly on the trunk, less frequently on the extremities. The skin over them is normal, unless irritated by pressure or friction, and the tumor is movable and soft at first, but later may become calcified. They rarely give rise to pain; but Osler mentions a case where there were seventy-five tumors, which were painful, the patient complaining also of numbness and tingling in the extremities and general weakness.

Fig. 30. — Cysticercus Cellulosæ. (After Küchenmeister.)

On excision or on opening the tumor, the parasite is found as a sac-like body, with the immature head either slightly projecting or sunk in, with a row of hooks and four suckers below them. It is easily ruptured in extraction, but the microscopic hooks and suckers are quite sufficient to establish its identity.

This parasite is the *scolex* or hydatid of the *Tænia solium*, or common tapeworm, which has found its way into the human stomach and has there been released from the ovum in the same manner in which this usually occurs in the pig. The parasites enter the system either by the wandering of a proglottis or section of the worm back into the stomach of one having tapeworm, or by their direct entrance after they have been discharged from the body and liberated from a proglottis. Being very minute they can find their way through water, food, etc.

The main interest which these tumors formed by the cysticercus possess is from a diagnostic point of view. They may be mistaken for *fatty tumors*, *sebaceous cysts*, *syphilitic gummata*, *multiple sarcoma* or *epithelioma*, and *rheumatic* or *gouty nodules*.

As the animals are encysted and can do no further harm, and the cysts gradually shrink up when the animal dies, *treatment* is rarely called for. When special nodules give inconvenience from their location or from having become inflamed, excision is the only proper treatment.

9. Echinococcus Cutis.

Hydatids in man are generally regarded as affecting mainly the internal organs, liver, kidney, lungs, brain, etc., but of late years attention has been called by Geber and others to their development in the subcutaneous tissue. Geber quotes Davaigne's statement that among three hundred and sixty-six cases of echinococcus, it occurred thirty times in the muscles and subcutaneous tissue, more frequently in women than in men.

The tumors which may develop are larger than those formed by the cysticerci. The semi-translucent, softish, fluctuating masses give little discomfort, except a feeling of heaviness and tension; the skin over them is unchanged. The parasite becomes encapsulated and usually dies in one or two years (although it lives very much longer in internal organs), and the contents of the vesicles change into a putty-like or granular material which may become partially calcified.

The echinococcus causing the tumor is the *larva* or *hydatid* of the *Tænia echinococcus* of the dog, which, though a *cestoid* like the tapeworm in man, differs greatly from it, in that the adult worm is less than one-quarter of an inch long and develops only a few proglottides at a time. As each segment, however, contains about five thousand eggs, the larvæ may become well diffused, and may be taken into the system in water, on fruit, raw vegetables, etc.

The little six-hooked embryo of the echinococcus also differs very materially from the cysticercus, in that after reaching the tissue in which it is to locate it again develops by a process of budding, so that a primary cyst may grow to contain a dozen or more daughter cysts (Fig. 31). These attain their greatest magnitude in unresisting structures, as in the liver and brain. In the skin the process never extends far, and the animal probably dies earlier here than elsewhere, owing to pressure.

Fig. 31.—Echinococcus Cutis. (After Leuckhardt.)

The affection is an exceedingly rare one, and a diagnosis would be very difficult. The discovery of hooklets microscopically in the contents of the tumor would alone establish a diagnosis.

10. Distoma Hepaticum, or Liver Fluke.

The liver fluke, not infrequently found in the liver of cattle and sheep, and occasionally in that of man, has been quoted by Küchenmeister as occurring in three cases beneath the skin. These occurred

on the sole of the foot, behind the ear, and on the scalp. In all of them there were produced abscesses: the latter two ruptured spontaneously, the former was opened.

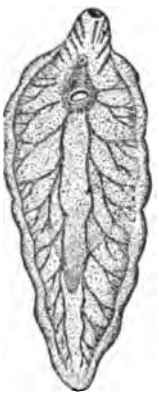

Fig. 32.—Distoma Hepaticum. (After Leuckhardt.)

The Distoma hepaticum belonging to the genus *Trematoda* is one of the most interesting in its life history of all parasites. It passes through a number of changes before it is taken into the stomach of animals and man, and develops the form and shape found there. As it appears there fully grown, it may attain a length of three-quarters of an inch. It is broad and flat like a leaf (Fig. 32), and has two suckers on its ventral surface anteriorly. Those observed in the skin have been smaller.

11. Bilharzia Hæmatobia, or Blood Fluke.

This parasite, which is also known as the *Distoma hæmatobium*, is exceedingly common in Egypt, where Bilharz, Napier, and others state that at least thirty per cent. of the inhabitants along the sweet-water canal are affected. The urinary organs are commonly attacked, hæmaturia being the most frequent symptom; but the spleen, mesentery, and other portions are also involved. The affection is also observed in Mauritius and in South Africa and elsewhere, and cases have been observed in France in patients who have been in Egypt.

Fig. 33. — Bilharzia (distoma) Hæmatobia. (After Leuckhardt.)

In one instance, at least, the ova of the Bilharzia hæmatobia have been found in the human skin by Starkey, who had the specimen sent from Cairo, but it is not known what the clinical symptoms were.

This distoma is a white, thread-like body, the male about half an inch long, the female nearly an inch, and from $\frac{1}{90}$ to $\frac{1}{312}$ of an inch thick. They each have two suckers by which they cling to the walls of the veins. The ova, which are given off very abundantly, are oval, strongly pointed towards one end, and have a delicate membrane, from which the young larva soon frees itself and penetrates the tissues. They are from $\frac{1}{160}$ to $\frac{1}{180}$ of an inch long, and have an average diameter of $\frac{1}{325}$ of an inch.

12. Œstridæ, or Bot Flies.

There are many species (about sixty) of the *Œstridæ* which are known to be parasitic in their larval state upon vertebrate animals.

Most of these infest the interior parts, as the stomach, nasal fossæ, frontal sinuses, etc., of many of the lower animals, and a few attack their skin. Thirteen species of the *Hypoderma* (Fig. 34) are known to live in the skin of the horse, ox, buffalo, sheep, goat, antelope, and deer; other species of this genus occur in the skins of rabbits, gophers, and opossums. Species of *Dermatobia* infest the skin of dogs, cattle, monkeys, and other animals.

Numerous reports have been made from time to time of authentic cases in which dipterous larvæ have been observed in and beneath the human skin, and there is now no question that this may occur, both in the country and elsewhere. The condition under consideration is quite different from that next to be mentioned, where another genus of flies lays eggs in open wounds which hatch there and remain localized. In the cases to be described the larva (often a single one and of some size) burrows beneath the skin, lives there a considerable length of time, and may even travel from one place to another. In South America this form of parasitic disease is by no means rare upon man; it occurs especially on the arms, back, abdomen, and scrotum. Humboldt saw Indians there having the abdomen covered with tumors produced by these larvæ.

The descriptions given by those who have observed cases of this affection differ so considerably that it is probable, as will be mentioned later, that many of them relate to quite different larvæ, from several different forms of fly. The most common conditions produced by larvæ are similar to those seen in animals, especially cattle. These consist in boil-like swellings (called warbles or worbles in animals) which shortly show a central opening, from which issues a seropurulent discharge, and through which the perfected worm finally escapes and seeks the ground. In man the process is usually interfered with, and the worm is often forcibly removed before its normal development is complete.

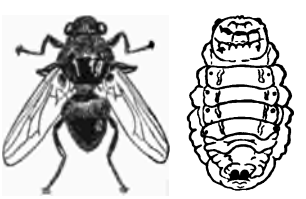

FIG. 34.—Hypoderma Bovis. Bot-fly and larva.

In many cases which have been reported the larva has travelled beneath the skin, often about an inch a day, but sometimes several inches. Its track has been marked by a reddish or purplish tortuous line, one-quarter of an inch or less in diameter, resembling an inflamed lymphatic, it fading behind as the larva progressed forward. At the end of a certain length of time suppuration occurs and it seeks to escape. These lines have been observed of the most varied shapes and sometimes ranging over a considerable area, from the extremities to the trunk, as in the cases described by McCalman, Walker, Crocker,

and Smith (Fig. 37). In some instances the larva can be felt beneath the skin as a small semi-solid body beneath the finger. In other instances boil-like tumors have appeared in one place from which a grub has been extruded, and then another at some distance from it. The inflammation seems to follow a little while after the presence of the parasite in any locality.

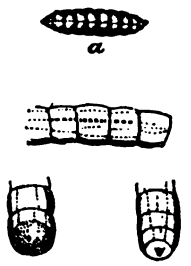

FIG. 35.—Larva of Œstrus. *a*, Natural size. (After Abraham.)

Sokoloff has recently described and pictured (Fig. 38) a very small larva, 1 mm. in length, which he has found in the epidermic layer of the skin, almost always in the face; he has met with two or three cases of the trouble every summer. The track of the larva is first straight, then curved, and is marked by a white cicatricial streak; it gives little annoyance except slight itching.

FIG. 36.—Dipterous Larvæ. Natural size after soaking in alcohol. (After Hyde.)

As before remarked, the symptoms given by different observers and the description of the larvæ which have been found have varied so greatly that it is more than probable that they come from several different species of *œstrus;* their larvæ are known even to live in the interior of the brain, and to travel, leaving their tracks behind them, as certain other air-breathing larvæ do in wood. Those affecting the human skin have probably belonged to the families of the Hypoderma (Fig. 34) or the Dermatobia.

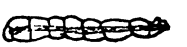

FIG. 37.—Dipterous Larva from Skin. Natural size. (After Smith.)

It is not known just how the larvæ gain access to the skin, except that they come directly from without, and not from within, through water or food. The female *œstrus* has a peculiar, horny ovipositor, sliding out like a telescope, and it is thought by many that she thus deposits the ova beneath the skin. Others deny this, and believe that the larvæ themselves bore into the skin, penetrating first one of the natural pores. When first hatched they are small, slender, and cylindrical, with their mouth parts adapted for boring. In animals they remain concealed beneath the skin until the following season, and until they have shed their first larval coat. In the latter part of their larval state, which extends over two or three months, they become much larger, measuring (in animals) about an inch in length, their skin becomes hard and tough, and it is now necessary to seek an external communication with the air, as in the case of the dracun-

FIG. 38.—Dipterous Larva from Skin. (After Sokoloff.)

culus of the Guinea-worm disease. These observations in natural history explain the occurrences on the skin of man. It was long thought that the accounts of grubs in the human skin were without true foundation.

The *diagnosis* of these conditions is difficult from their great rarity. They are seldom to be looked for, but when single or scattered, sluggish, boil-like lesions are encountered, especially in warm climates, these may be suspected; and such a travelling and changing line of reddened skin as has been described would also be suggestive.

The *treatment* is the removal of the offending parasite. Free incision will give exit to the worm in isolated lesions; in the serpiginous lines the animal is found at the advancing extremity or just beyond. After removal the wounds heal kindly with proper surgical precautions.

13. Muscidæ, or Common Flies.

Flies of this class affect the skin in quite a different manner from those just described, for two reasons: They deposit their eggs in large numbers at a time, and the eggs are hatched out very quickly, even in about twenty-four hours. Further, their larvæ have not the power of penetrating tissues, but live upon soft and succulent material, where the eggs are usually deposited.

These, therefore, are the larvæ or maggots which have at times been found in open and neglected wounds. A brief exposure of a surface is sufficient, at the proper season, to allow of the deposit of ova, which may shortly produce the parasites in question. The principal flies which infest wounds are the *Sarcophaga carnaria* (or flesh fly), *Calliphora vomitoria* (or blow fly), *Compsomyia macellaria* (or screw-worm fly) and the *Musca domestica* (or common house fly).

In addition to the animal parasites which have been described, there are many others mentioned by Leuckhardt, Cobbold, Küchenmeister, Megnin, and others, which have at times been known to attack the human skin, but which are so rare or so uncertain that they can hardly be considered here. A brief mention of some of them must suffice. Such are:

The *Hæmotopota pluvialis*, the clegg of the West Highlands which violently attacks man and beast.

The *Simulium reptans*, creeping gnat, very annoying in Sweden.

The *seroot fly*, or *zimb* (species of Pangonia), excessively annoying to travellers in Abyssinia.

The *Acanthia rotundata*, of Réunion Island, and *Acanthia ciliata* of

Kazan, whose bites are worse than those of the common species of bedbugs.

The *Conorhinus nigrovarius*, the Pampas benchucha of South America, which in ten minutes after sucking blood changes from being flat as a wafer to a globular form.

The *Ixodes monbate*, at Angola, a virulent bedbug: pain comes on two hours after bite.

The *Ixodes carapato*, similarly troublesome in Brazil.

The *Argas persicus*, or miana bug of Persia, whose bite is so venomous as to have occasioned death.

The *Argas chinche* of Colombia, whose bite is also very severe.

The *Galeodes araneoides*, a large spider-like creature, two inches in length, with an extremely venomous bite.

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B. VEGETABLE PARASITIC DISEASES.

The growth in and upon the skin and its appendages of certain vegetable organisms causes changes in them which have long been recognized by the name of vegetable parasitic diseases. These parasites belong mainly to the family of hyphomycetes, that of moulds and fungi. The action of these vegetable growths is a purely local one—that is, the lesions are produced by their local action upon and in the elements of the skin and its appendages, the hair and nails,

and not by their absorption or by any action of the parasite upon the blood or the system at large.

These eruptions are always acquired from outside, and when communicated from one person to another, or developing elsewhere on the same individual, it is by the direct or indirect transference of the spores or germs of the parasite to and upon the affected part.

The parasite may generally be secured for examination without very much trouble, and its recognition does not commonly require great technical or microscopical skill; it should always be undertaken by the practitioner, certainly when there is any doubt as to diagnosis. Also in the progress of the case this means alone can determine when the disease is entirely eradicated.

A very satisfactory solution for the study of these vegetable parasites is a mixture of equal parts of liquor potassæ and glycerin, to which a trifle of carbolic acid or thymol is added to keep it aseptic. A drop of this liquid is placed on an ordinary slide of a microscope, and the surface to be examined is scraped in such a manner that the scrapings will fall on the slide, and that retained on the dull knife blade is to be added to this; all the scrapings are then gently brought into perfect contact with the fluid, and a cover of thin glass placed over it, and lightly pressed down. When the affected part has hairs, these are to be extracted and immersed in the drop on the slide. If there is much fatty matter present on the scales or hairs it is well to soak them first in ether. When the fungus is not seen clearly at the first examination it will often become more distinct if the specimen is left for a day or so; the scales or hairs thus become thoroughly soaked with the fluid and not infrequently the spores and mycelium will appear clearly defined where before none were visible. A medium power, from three to six hundred diameters, is all that is necessary for most work; in doubtful or difficult specimens special microscopic assistance may be necessary.

The diseases belonging to this group are as follows:

Diseases Caused by Vegetable Parasites.

I. Tinea trichophyton, or ringworm.
II. Tinea imbricata, or Tokelau ringworm.
III. Tinea versicolor, or pityriasis versicolor.
IV. Tinea favosa, or favus.
V. Erythrasma.
VI. Myringomycosis.
VII. Vaginomycosis.
VIII. Labiomycosis.
IX. Pinta, or spotted sickness of Mexico.

X. Actinomycosis.
XI. Mycetoma, or Madura foot.
XII. Alopecia areata (some forms).

I. Tinea Trichophytina.

Synonyms.—Trichophytosis; dermatomycosis trichophytina; ringworm; Fr., *Trichophytie.*

The growth of the parasite *trichophyton* produces quite different appearances, according as it attacks various portions of the body. These may conveniently be studied under five different heads, to which as many distinct names have been given to the eruption produced, namely:

1. Tinea trichophytina corporis, ringworm of the body, face, and limbs.
2. Tinea trichophytina cruris, ringworm of the crotch and axilla.
3. Tinea trichophytina capitis, ringworm of the scalp.
4. Tinea trichophytina barbæ, ringworm of the beard.
5. Tinea trichophytina unguium, ringworm of the nails.

These forms of eruption are really one and the same disease, although they were formerly thought to be separate affections. It would be quite possible for all of them to be found on the same individual, and not infrequently there is more than one form present.

The extent, severity, and obstinacy of the disease vary very greatly in different persons, depending somewhat upon personal idiosyncrasy as well as on the bodily health and surroundings. Those with light hair and complexion and delicate skin are far more prone to the eruption, and in them it is apt to be most rebellious.

The frequency of the disease varies very greatly in different countries and at different times, and also according to the station in life of the patients and their personal care.

Ringworm is preëminently a disease of young life, three-quarters or more of the cases probably occurring in persons under twenty years of age. The youngest patient seen by the writer in private practice was in a boy seven months old, the next in a boy two years and three months old.

The disease is undoubtedly most common among the poorer classes, and often spreads with great rapidity and obstinacy in schools and asylums where the young are congregated together, especially when necessary precautions against infection are omitted. In one public institution in New York City, sheltering between seven and eight hundred children, 367 cases of ringworm of the scalp were recently found. Crocker's statistics from London give the percentage

of cases of ringworm of all forms to other skin diseases at 16.3 in public practice and 7.2 in private practice. In this country the statistics from over 200,000 cases of miscellaneous skin diseases collected by the American Dermatological Association, largely from public practice, give 3.43 per cent. for the disease. In the writer's practice in New York City the various forms of trichophytic disease gave 3.11 per cent. in public clinics and 2.46 per cent. among 10,000 cases in private practice.

Cases of trichophytic disease should never be considered too lightly by the physician, for the neglect of proper precautions may be the means of infecting many others. Parents should be warned of this danger, and care should be taken, not only in regard to members of the family (sleeping together, etc.), but also as to their associating intimately with others, as children at school, etc. Undoubtedly much of the disease is propagated by carelessly wearing hats of others, using combs, brushes, towels, etc., and in the barber's shop. Many of the public schools are now very stringent in regard to the attendance of children who are suspected of having ringworm. As ringworm of the scalp especially is a very obstinate affection, great care should be exercised against relaxing treatment and in regard to allowing children to mingle freely with others until the disease is surely eradicated, as demonstrated, not only clinically but by the total absence of the parasite in microscopical examination.

We may now consider the various manifestations of the disease on different parts of the body and the appropriate treatment, which often varies materially according to the location, condition, etc.

1. Tinea Trichophytina Corporis.

Synonyms.—Tinea circinata; herpes circinatus; ringworm of the body; Fr., *Trichophytie circinée.*

Ringworm of the body (including the non-hairy face and limbs) varies very greatly in form and appearance in different cases, from a single small spot, which may be checked early, to an extensive eruption covering much of the surface, the latter, however, being very rare. Single spots, or several, are not very uncommon on the face and hands of children, and in one instance the writer counted one hundred and three separate rings on a child, mostly on the face, arms, and chest. But, however numerous or diffused they may be, the rings or patches always begin with a small point, which increases peripherally, with a tendency to clear in the centre.

The small red spot which marks the beginning of the eruption cannot be distinguished at first from other lesions, unless there are

already other patches or rings present. But it soon becomes a little scaly and enlarges with considerable rapidity, so that in two or three days or a week it may attain the size of a circle half an inch or more in diameter. As it increases at the border it has a tendency to clear in the centre, leaving the skin, however, not perfectly healthy, but of a yellowish hue and slightly scaly.

The margin of the advancing circle is generally sharply defined, slightly raised, of a well-marked red, and covered with a small amount of easily removed scales. Sometimes in delicate skins a few small vesicles will form on a wider border, and even superficial pustules may appear; but this is rare. Seldom will there be but a single ring or patch where the disease is of any duration; others appear near by or at a distance, where the spores chance to light, but there is no symmetry in their arrangement. When several rings have developed near each other they will often run together and coalesce, thus producing irregularly shaped and gyrate figures. Occasionally a new point will develop in the centre of an old patch and a second ring be formed within the old one, and even a succession of rings within each other; as many as four have been observed. Ringworm does not usually attack the palms and soles, but may do so in chronic and severe cases. Occasionally, however, it may appear primarily or principally in these places, and several cases are on record where the eruption has produced a vesicular eruption in this location, very difficult of diagnosis.

There is seldom much irritation in ordinary ringworm as here described, although there is often a very great amount of pain and itching connected with that in the crotch and axilla, next to be mentioned. In delicate skins there may be moderate itching, and sometimes the remedies which are used for the destruction of the parasite may irritate the skin and set up much dermatitis.

Pathology.—The eruption is a superficial inflammation of the skin wholly due to the growth in the outer layers of the epidermis of the vegetable parasite *trichophyton*. The spores, or conidia, which are exceedingly minute, about $\frac{1}{7000}$ of an inch in diameter, readily find lodgment in the fissures of the epidermis, and speedily develop, throwing out branching, tube-like prolongations, called mycelium. This penetrates between the epidermal scales in all directions, ever tending to attack new tissue; thus the spot increases peripherally until the pabulum in the tissues suited for the parasite is exhausted, and a slightly scaly surface is left on which there is very little of the fungus. The material for microscopic examination is generally best obtained from the advancing line.

Under the microscope the flattened epidermal scales are seen

crossed in all directions by the branched and jointed mycelium, with but few spores (Fig. 39). The relative absence of spores is in marked contrast to the condition usually found in ringworm of the scalp and beard, and also to that in favus and tinea versicolor; in the latter the groups of spores form a distinguishing feature.

The mycelium appears in the form of long, slender, delicate thread-like tubes, of a pale greenish tinge, forked here and there and broken up by joints into shorter or longer sections; some of these may at times be very long. The end of the advancing thread is always perfectly rounded, often a little bulb-like.

Diagnosis.—Ringworm of the body is most likely to be confounded

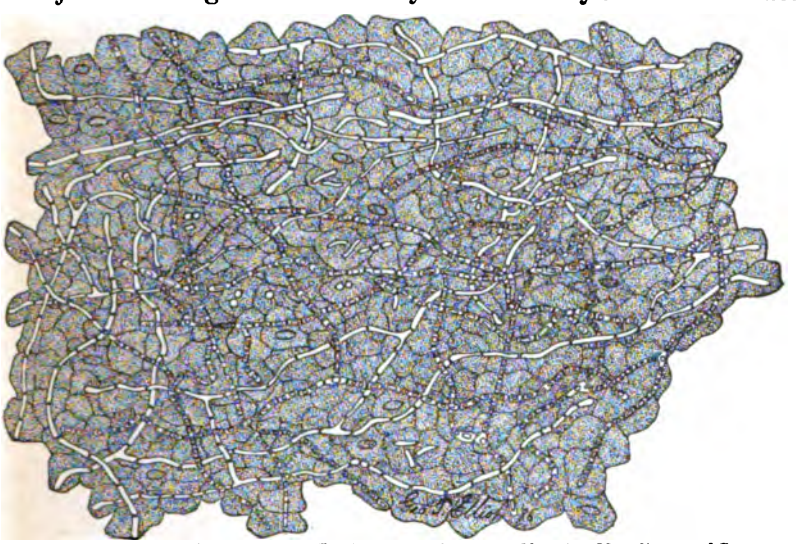

Fig 39.—Epidermis Scale from Tinea Trichophyton Corporis, Showing Mycelium and Spores.

with *psoriasis*, *eczema seborrhœicum*, a *ringed syphilis*, *lupus erythematosus*, and possibly *herpes iris*. The history of the case, the rapid development of the circles, with an early clearing in the centre is different from the course observed in *psoriasis*, which only clears up later; moreover, the scaling and general color differ much from psoriasis. The circular patches of *eczema seborrhœicum* are more greasy, more yellowish, and generally itch more than ringworm. Certain early forms of *ringed syphilis* may resemble ringworm closely, and also some of the later papulo-tubercular lesions; but there are generally other indications which establish syphilis when present. *Lupus erythematosus* is rare compared to ringworm; its progress is very slow. The discovery of the parasite in the scales of ringworm is, of course, conclusive, but sometimes it will be difficult to obtain satisfactory evidence except after long and careful search.

Treatment.—This form of trichophytic disease is usually quite easy of removal by local means alone; when it persists or recurs in those of anæmic or other faulty condition of body, this should be removed by appropriate dietary and tonic measures. Some care is often necessary that reinfection does not take place by means of clothing.

Any applications which destroy the life of the parasite without causing much inflammation of the skin will be serviceable, and these are found principally in the preparations of iodine, mercury, and sulphur, with some others. The common domestic remedies serve very well in mild cases; tincture of iodine, a penny wet in vinegar (making acetate of copper), also castor oil, etc. The ointments of the white precipitate, red oxide, or nitrate of mercury, diluted three to five times, with a little carbolic acid and possibly with half a drachm of sulphur to the ounce, and well rubbed in, form an excellent application. The hyposulphite of soda, a drachm or two to the ounce of water, will often quickly destroy the parasite; pure sulphurous acid, used as to be described in the next section, is very effectual, though at times somewhat irritating. Bichloride of mercury, two to four grains to the ounce, also acts well; chrysarobin, ten to forty grains to the ounce of ointment, is also effective, but the disagreeable stain is a drawback. Where the disease is very extensive sulphur or mercurial vapor baths act promptly, and should be followed by a general inunction of carbolized vaseline, five to ten grains to the ounce.

Prognosis.—Body ringworm should generally yield to rightly directed treatment in a relatively short time, but it sometimes proves rebellious. It may extend to the scalp and so prove extremely stubborn.

2. Tinea Trichophytina Cruris.

Synonyms.—Eczema marginatum; ringworm of the crotch (and axilla).

Although this is exactly the same disease as the former, and dependent upon the same parasite, the appearances of the eruption differ so much from those commonly observed when the disease is on the body, face, and limbs, that a separate description is necessary. Hebra at first regarded it as a distinct affection, under the name *eczema marginatum;* but it is now well recognized to be only trichophytic disease, modified decidedly by the peculiarity of the situation. Not only does it appear thus different when affecting the crotch on either side, but also in the fold between the buttocks, beneath pendulous mammæ, and in the axillæ.

In these situations the constant warmth and retained secretions

cause the parasite to grow with unusual vigor, and the inflammation excited thereby is much greater than in ringworm elsewhere. Itching is also a very prominent fature, especially in the crotch, and the suffering produced by the eruption in this locality is often severe in the extreme.

It is not generally easy to observe the early development of the lesions in these localities, from one or more small spots, as elsewhere on the body. When attention is first called to the eruption there is commonly a red or pigmented, and often moist area, perhaps of some size, pretty distinctly marginated, with a somewhat raised border, a line or more in width, with rather thick scales, and often with papules or vesicles; sometimes new rings or papules form within the orginal enclosure and also outside of it. The festooned border commonly remains limited to the parts which touch one another, as where the scrotum lies on the thigh, or on the opposite sides of the thigh in females, or in the folds of the buttocks, or where the mamma touches the skin or in the axilla. But occasionally these gyrate lines may increase and spread downwards upon the thigh or upwards on to the abdomen and even over the sacral region.

This form of eruption is more common and more severe in warm climates, and is often spoken of as *Indian*, *Chinese*, or *Burmese ringworm*, also as *Dhobie's itch*. It is, however, not infrequent in this country and formed almost twenty per cent. of the trichophytic cases in the writer's private practice previously alluded to. Of these cases 56 were in men and only 10 in women; but the great preponderance of men may be largely due to natural feelings of delicacy on the part of the female sufferers.

Pathology.—The entrance of the parasite in this location is similar to that previously described, but the inflammation being greater, it is generally more difficult to find and demonstrate it microscopically than when the disease occurs elsewhere. The scrapings are to be made, not in the more irritated portions, but on those which are more dry and scaly, and frequently it will be necessary to make several preparations before the fungus can be clearly demonstrated. It then appears in the scales much as in the drawing already given (Fig. 39), but there are apt to be more free spores.

Diagnosis.—*Eczema* of these regions is about the only eruption to be differentiated, and if the distinction is not made treatment will be futile. The eruption will not yield to soothing or protective treatment, but does rapidly cease with proper parasiticidal applications. Simple eczema of these parts does not present the sharply defined border belonging to the parasitic disease, but instead of being more marked at the margin it is apt to be worse in the centre and to fade off grad-

ually at the edge into healthy skin. In some cases, however, both troubles are combined. There may have been an eczema of some duration, when later the parasite becomes engrafted upon it and manifests its characteristic border, and can be found microscopically.

Treatment.—There is one remedy which if used exactly in the right manner seldom fails to check and permanently cure eczema marginatum, and that remedy is sulphurous acid. But it is extremely necessary that the remedy should be absolutely pure. Much of that which is sold in the shops has stood some time, and by frequent exposure to the air has become more or less changed into sulphuric acid, which is intensely irritating and not so effective. The writer, therefore, always orders a fresh, unopened pint package of the acid to be served to the patient, who fills a small bottle from time to time so as not to expose the bulk to the air. The acid may be diluted for very tender skins, but generally can be used full strength. A soft cloth is wet in it and held to the part for a few moments, keeping in the fumes; it is then re-wet and applied again. After it is dry it is often well to sop on a calamine and zinc lotion, or to apply quickly a bland ointment.

The first sensation following the application of the acid may be a burning pain, but this passes off at once, and relief is afforded to the itching, which is generally so pronounced a feature. With a thorough application of the acid, morning and night, few cases fail to do well.

Hyposulphite of soda in water (℥ i.–ij. ad ℥ i.) serves fairly well, and weak bichloride of mercury lotions check the disease. Where there is much inflammation it is often wise to use first a treatment for eczema, such as the ointment of tar and zinc (℞ Unguenti picis, ℥ ij., zinci oxidi, ℥ ss., unguenti aquæ rosæ ℥ vi.) spread on lint, and kept firmly bound on ; then, as the acute eruption improves, parasiticides may be applied to the characteristic portions. Often half a drachm of powdered salicylic acid, or a drachm of sulphur or a couple of drachms of white precipitate ointment, added to the above ointment, will be all that is necessary. When single patches remain the compound tincture of green soap (℞ Olei cadini, saponis viridis, spiritus vini rectificati, āā ℥ i.) is needed.

Prognosis.—Eczema marginatum is a thoroughly curable disease; but occasionally it will remain and persist in a discouraging manner. Sometimes when apparently cured it will recur, either because some spores deeply lodged have not been reached, or in consequence of reinfection from the underclothing, or in some other way. Sometimes the eruption excited by the treatment is mistaken for the continuation of the disease, and so it is apparently prolonged.

3. Tinea Trichophytina Capitis.

Synonyms.—Tinea tonsurans; herpes tonsurans; ringworm of the scalp; Fr., *Teigne tondante;* Ger., *Scheerende Flechte.*

Ringworm of the scalp has come to be regarded by those who know most about it as one of the most troublesome diseases of the skin; it is also much more frequent than many suppose. The damage that it may do in some cases is so slight that it is often overlooked, and undoubtedly there are many cases which go for years untreated, endangering those around them. The writer has known many such, both in public and private practice.

This form of trichophytic disease is particularly one of childhood, and in the writer's private practice out of seventy-eight cases there were only two over thirteen years of age; the youngest was two and a half years old. This form of eruption will spread with great rapidity among those associated together, in schools, asylums, factories, etc., as in the instance already mentioned, where there were found three hundred and sixty-seven cases among seven or eight hundred children in an institution.

Statistics vary very greatly in regard to the frequency of ringworm of the scalp, largely according to localities. Thus Crocker states that this disease forms ten per cent. of all cases in his clinic in London, while in the writer's public clinics in New York this particular form of trichophytic disease formed only about one per cent.; this, however, did not include large numbers of cases seen at various times in institutions. The physician should never neglect to give the greatest and most persevering attention to cases of this disease, for although its immediate effects on the child (for, as remarked, it is largely a disease of childhood) may not be serious, the ultimate results from one neglected case may be very far-reaching for evil; while the annoyance to the family and the restrictions it places on the child as to school, etc., may be very troublesome.

Tinea tonsurans is not always so easy of recognition as might be supposed, and in cases which have lasted any length of time the diagnosis may be very difficult. The eruption begins upon the scalp, as elsewhere, as a single small red point or papule; here it is situated around a hair. This soon becomes covered with a grayish scale and increases peripherally, involving one hair after another, and the area between. At first there is not much to be seen except the scales upon a slightly reddened surface, as the hairs are not affected, certainly not broken off, until a little later.

In some cases the disturbance on the scalp caused by the parasite will be very light, and the true nature of the disease will hardly be

suspected at first, there being only a rather indefinite scaling, with some thinning of the hair, little if at all broken, and with none of the sharply defined characters which might be expected. Such cases are particularly dangerous to others, for unless careful microscopic examinations are made the patient may escape proper treatment and infect many others before the true nature of the trouble is discovered.

The typical case of ringworm of the scalp exhibits one or more partially bald patches, strongly suggestive of a partly re-grown tonsure of the priests, whence its name. These are generally of a bluish or leaden color in darker skins, and grayish or a little red in those with lighter skins; the surface is dotted over with small black points which are found to be the short stumps of hairs which have been broken off by reason of the disease. They are often easiest detected by passing the finger very lightly over the part. These "stumps," which may be almost regarded as pathognomonic of the disease, are commonly from one-sixteenth to one-eighth of an inch long, and are really somewhat larger than the adjoining healthy hairs, being filled with the fungus, the end being frayed out where it has broken off.

In attempting to extract these "stumps" with the forceps the hair gives way again, leaving the bulb in the follicle. These "stumps" are readily broken off in brushing the hair and in various ways, and, with the infected epidermal scales communicate the disease to others. When lightly scraping the patch for microscopic study these stumps readily separate and are to be particularly examined.

Chronic or Disseminated Ringworm.

This name is given to cases which have lasted some length of time, in which the affected surfaces on the scalp may not and generally do not present the typical, shorn appearance described. After a certain duration, and especially after more or less satisfactory treatment, many of the hairs assert their vigor, and, although under the microscope they may present some evidence of the parasite, they grow to considerable length, and the characteristic features of the disease are obscured. The hairs, however, will not be quite natural, but will be more or less lustreless, and the scaling will continue, with some of the stubbed hairs between. This condition, more or less as just described, is often one of the most puzzling diseases, both as to diagnosis and treatment, which can be presented. As Alder Smith has shown, many of these cases go about for years, and he has known an outbreak of ringworm to occur in a school from a child with a single spot no larger than a split pea, and where only a few stumps could be found on close examination with a lens. Among 1,349 healthy boys aged from eight to ten years, whom he examined

for entrance to a charity school in London, and who were supposed to be quite free from ringworm, he found this present in 112 cases, or 8.3 per cent. of the whole. Many cases also came to him with certificates from reputable physicians that their ringworm was cured, when on careful study they were found to have abundance of the disease in this disseminated form. Too great care, therefore, cannot be exercised by family physicians in deciding on these cases.

Before discharging a case as cured every portion of the scalp should be looked over with a hand lens of moderate power and with abundance of sunlight. It is well to have the little patient seated on a stool, and to begin with the back of the head. To make any satisfactory examination the hair should all be cut to about an inch in length. Beginning at the bottom of the scalp the hair should be turned upwards slowly, with the blades of the forceps or the finger, and allowed very slowly to fall into place; this should be systematically done in such a manner that every portion of the skin of the scalp can be carefully inspected. As the pale surface of the scalp comes into view, the short, dark stumps will be readily seen with the lens or the naked eye. The same method should be employed in examining new cases where doubtful, and also children in schools where it is desired to surely detect the disease.

Tinea Kerion.

This is a somewhat unusual feature of ringworm. In this condition the parasite, probably with the addition of pus cocci, has set up so great an inflammatory state in the follicle that suppuration results. This is far more commonly seen in ringworm of the beard, next to be described. Upon the scalp, kerion generally appears as a tolerably well-defined patch, somewhat raised, boggy, and of a deep-red color, with many small suppurating points, in the centre of which stand the diseased and blackened hairs; when the disease is at its height these are loosened in their follicles and can be readily extracted without pain. A long continuance of this condition tends to result in the cure of the parasitic disease in the patch, and a similar state is sometimes produced artificially with such remedies as croton oil. But with the excessive inflammation there is some danger of a destruction of the hair follicle and permanent baldness.

Bald Tinea Tonsurans.

In some rare cases of ringworm, instead of there being any inflammatory action attending the presence of the fungus, there will be a peculiar absence of the ordinary signs of the disease and only a smooth baldness, at some stages in no way distinguishable from alopecia areata. There may be one or several patches, which are

smooth and shiny, almost if not quite devoid of hairs, "stumps," and scales, and with good hair around them. But on the edges may generally be detected some "stumps" which will reveal the parasite under the microscope. Whitehouse has recently reported such a case, where several other children had characteristic ringworm of the scalp and neck and arm. The disease began much like an ordinary ringworm, as a scaly papule, which enlarged to the size of the little finger nail before the hair fell out; the smooth and shiny appearance developed later. The hair around the patch came out easily, and in certain "stumps" the parasite was clearly seen, by the present writer, after the hairs had been left for several days in a warm place, soaking in liquor potassæ and glycerin. There have also been many other similar cases recorded.

Hillier reported an instance where forty-three girls in a parish school of eleven hundred were thus attacked, starting from one girl similarly affected. There were no cases among the infants or boys, who were quite isolated from the girls.

Cases of chronic ringworm of the scalp which have been long under treatment, with epilation, etc., present features not included in the previous accounts, and which it is extremely difficult to describe. On surfaces, which may at the time be apparently bald, where the disease has been, or, rather, is still present, the skin is of a darker condition than that surrounding, and on close examination the coloration is found to be due to the enlarged and darkened hairs in the follicles, they having been broken off at the level of the skin by epilation or friction. This choking of the hair follicles with diseased hairs forms one of the obstacles to successful treatment, as the remedies cannot penetrate to the tissues where the fungus vegetates, and the fragile state of the hair from the parasite prevents emptying the follicle by epilation. In some patches the imperfect hairs will grow up feebly with a whitish sheath around them, giving an appearance resembling the so-called "goose flesh."

Etiology.—While the eruption in ringworm is unquestionably due to the presence and growth of the vegetable parasite, there is some other factor of which we as yet know very little. All children are by no means equally susceptible to its attacks; even in families and schools many will escape who are thoroughly exposed. On some patients, again, the fungus takes slight hold, and the eruption is easily cured; in others the disease spreads with great rapidity and persists with a most distressing rebelliousness, in spite of the best directed treatment, faithfully carried out.

What this difference consists in has not yet been definitely de-

termined, but it probably resides in a certain weakness or strength of tissue which either offers or fails to offer the proper nourishment for the parasite.

The trichophyton is originally a saprophytic fungus and affects live animal tissue only incidentally, and Leslie Roberts has shown that it attacks hair readily when it is detached from the scalp, that is, when it is no longer part of a living structure.

The hair even when attached to the head is a very slightly vitalized structure, and in children it is peculiarly delicate and non-resisting, as are their other structures to outside injurious influences. Furthermore, in proportion as the strength and vitality of all tissues are lowered, by so much are they more susceptible to the attacks of the lower order of the microörganisms which lead to disintegration. The observation of many has been that this disease occurs more frequently and persistently in those whose general health and vitality are lowered by poor nutrition and bad hygiene, and although its subjects may often be in apparently good health, careful investigation will commonly show that those in whom it persists and resists treatment are not up to a high standard of vitality.

An element of importance in connection with etiology is also the color of the hair and skin. Roberts has shown by experiments on portions of removed hair that the trichophyton fungus penetrated and digested light-colored hairs very much more rapidly and thoroughly than those which were darkly pigmented, and concluded that pigment in hair "had probably something to do with its greater resistance to the action of the fungus." This confirms what many writers have stated that the disease is much more liable to attack those with light skin and hair.

Sex has little to do with its etiology. Crocker found that there were six per cent. more boys than girls affected out of four hundred cases. Of 318 cases at the New York Skin and Cancer Hospital, 191 or 60 per cent. were in boys; the writer's statistics from private practice give a still larger proportion.

Age, as has been shown, is a great factor in ringworm of the scalp, which has a tendency to self-limitation with the stronger development of the hairy elements of the body at the approach of puberty. But Crocker has called attention to the fact that while the hair of the scalp in adults generally resists the parasite, it readily attacks the beard and often penetrates into its hair shaft.

Pathology.—Much study and discussion have arisen in late years as to the botanical relations, physiology, and pathology of the fungus found in connection with the various forms of trichophytic disease, especially with that occurring on the scalp, and certain questions re-

lating thereto are by no means yet settled. Some years ago it was thought that all vegetable parasites of the hyphomycetes class were but modifications of the same fungus, presenting differences according to location and soil; but now that of favus, tinea versicolor, etc., have been fully differentiated from the trichophyton, and are recognized as never interchangeable clinically.

In regard to the fungus found in cases of ringworm of the scalp much interest has been developed by the recent elaborate studies of Sabouraud, at the Hôpital St. Louis, Paris. He claims that there are two quite distinct forms or species of trichophyton found in cases of ringworm of the scalp, namely, one presenting large spores (*megalosporon*) and one exhibiting small spores (*microsporon*). These differ materially in their life history and in their growth upon various media when cultivated, and likewise in their pathological effects on the human skin and its appendages. Gruby, who originally discovered the parasite, had pointed out some of these differences in 1842, 1843, 1844.

According to Sabouraud the *trichophyton microsporon* is the common fungus of tinea tonsurans in children, especially of those cases which are rebellious to treatment, and its special seat of growth is in the substance of the hair; growing outside the hair it forms a dense sheath around it. This small-spore variety he identifies with the *microsporon Audouini*, as described by Gruby, which has long been erroneously connected with true alopecia areata. The *trichophyton megalosporon* is essentially the fungus of ringworm of the beard and of the smooth parts of the skin, and when the hairs of the scalp are implicated the prognosis as regards treatment is good. One-third of the cases of tinea tonsurans in children are said to be due to the *trichophyton megalosporon*. He thinks further, that there are several species of the megalosporon, one of which, that common in the horse, gives rise to pustular lesions. In brief his conclusions are as follows: 1. Under the name tinea trichophytina there are included two entirely different diseases, which are equally frequent, and have only this in common, that they both attack the hair; 2. One of these diseases is caused by a parasite which is the cause of ringworm in other locations, and to which the name tinea trichophytina is appropriate; 3. The other disease, to which he gives the name "*tondante speciale de Gruby*," is caused by another parasite, the *microsporon Audouini*, which is not a trichophyton.

These views of Sabouraud have received support and also have been opposed on many sides, and much further study is desirable. Certainly those who have had much clinical experience with ringworm of he scalp appreciate the marked difference between different cases, and much microscopic study of specimens from them demon-

strates considerable difference between the appearance of the parasite found in separate cases. Leslie Roberts, studying the physiology of the fungi and their mode of growth under cultivation, does not agree with the conclusions of Sabouraud, and would base the differentiation upon their keratolytic power, that is, on their ability to dissolve or digest the keratin in horny animal tissues and hair. This he finds to exist alike in all the forms of fungus found in ringworm, and he would therefore class all as trichophyton.

This keratolytic action of the fungus explains in part its entrance into the hair. It was formerly thought that the parasite entered the follicle first by the side of the hair and penetrated to the softer tissues before entering its body. It is now known that it can enter the shaft at any place (Fig. 40), within or without the follicle.

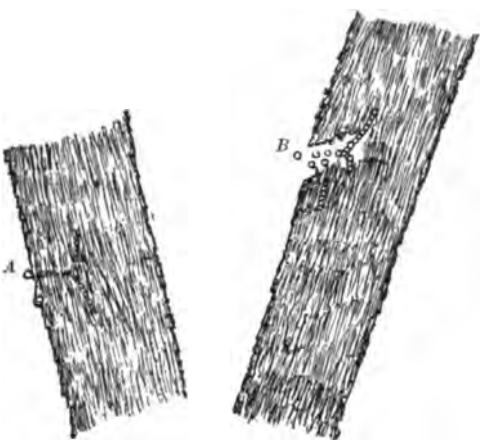

FIG. 40.—Hairs beginning to be invaded by Trichophyton Tonsurans: *A*, in earliest stage; *B*, later. (After Roberts.)

The appearance of the fungus in ringworm of the scalp is modified by the structure of the tissues, and appears quite different from that found in epithelial scales. Most commonly it is in the form of what are called spores, small, uniform sized, round bodies (which should be distinguished from fat globules) which penetrate the hair and its sheaths even to the bottom of the follicle (Fig. 41). This explains the extreme rebelliousness of the disease on hairy parts. In broken bits of hair the fungus will often be found so abundant that there seems to be little left of its proper substance. At the broken end of the hair the spores will be seen lying between the brush-like fibres which have been separated by it, while often detached spores will be found floating in the fluid in which the hair is placed for examination. Under *certain* circumstances, when the hair is peculiarly suited, the fungus *will* exhibit mycelium within its structure (Fig. 42), much like that seen in the epithelial scales from tinea circinata, only that it presents much shorter joints. When the fungus is not readily found at first, it often becomes much more clear if the specimen is left soaking for some hours in the liquor potassæ and glycerin.

Diagnosis.—The diagnosis of ringworm of the scalp may be very easy, or it may be extremely difficult. When there is a circular patch,

grayish and scaly, from which the hairs have fallen, leaving blackened stumps, there is practically no question as to the diagnosis. But among a large number of cases, as seen together in a public institution, perhaps not one-half of them would present such clear and distinctive marks, and in many instances the disease would be hardly suspected. The practitioner should, therefore, be extremely careful in pronouncing as to these cases, for grave trouble may follow an error.

It is pretty safe to suspect every scaly condition in the scalp of a child to be ringworm, and to institute a careful examination to determine the fact or not; in doubtful cases the microscope should certainly be used.

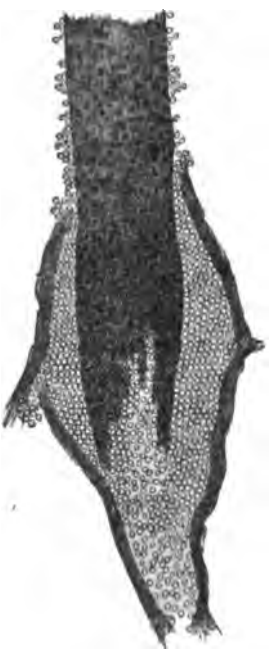

FIG. 41.—Hair and Root Sheath, from Tinea Trichophyton Tonsurans, showing abundance of Spores.

FIG. 42.—Hair from Tinea Trichophyton Tonsurans, showing Mycelium and Spores.

The diseases which may be mistaken for it are *eczema*, *seborrhœa*, *pityriasis capitis*, *psoriasis*, and possibly *syphilis;* favus is so distinctive that it should not be suspected. Bald ringworm simulates *alopecia areata* very closely, and tinea kerion might possibly be mistaken for *carbuncle.*

Some of the slightly developed and neglected cases, or even some cases of chronic ringworm, resemble a dry scaly *eczema* or *seborrhœa* quite closely, or even a *pityriasis capitis;* but neither of these would have any of the "stumps" which, it may be said, must exist where there is any hair. Consequently the careful search of all the scalp with a lens may be necessary. *Psoriasis* seldom attacks the scalp alone, and the characteristic eruption elsewhere should establish the diagnosis. On the scalp the circular patches of psoriasis are more red and scaly, and the hair is seldom lost, and the "stumps" are absent. The same may be said of any possible lesions of *syphilis.*

The diagnosis between the rare cases of bald ringworm and *alopecia areata* may present the very greatest difficulties. But the his-

tory of the eruption, which in the parasitic disease does not start as a smooth surface but more like ordinary ringworm, should always rouse suspicion. A careful search of the hairs around the margin will then detect the "stumps"; these, however, should be studied microscopically, for the non-parasitic disease may likewise present stubbed ends of hair, but they are atrophied and pointed, and have no parasite. A little care will readily distinguish between the boggy red and raised condition of tinea kerion and *carbuncle*. Moreover, the history of kerion is that of ringworm.

Treatment.—While the treatment of ringworm of the non-hairy parts has been spoken of as relatively simple and the prognosis good, that of ringworm of the scalp may be difficult in the extreme—that is, to effect a complete cure; for, as may be judged by what has preceded, it is by no means easy to reach the site of the parasite when it has burrowed deep in the follicles. The importance of early and thorough treatment is thus seen to be very great, for, as has been shown, when once the hair is thoroughly permeated by the fungus it breaks off and really cannot be extracted to allow the remedy to enter.

Many remedies and measures have from time to time been brought forward and advocated, and rapid cures are often reported from some of them; but any one who is thoroughly familiar with the disease in all its phases and stages will recognize that there must be an error in regard to many of them, for no such results can ordinarily be obtained from them as would be expected from the claims set forth. In other words, one must believe that the cases supposed to be cured so easily were either those which are often seen to yield readily under any well-directed treatment, or else that cases were *supposed to be cured* when only the outer manifestations were removed. In these cases deep-seated fungus often remains, quiescent for a while, ready to produce fresh lesions when restraint is removed or when proper conditions are presented.

The very number and variety of remedies and combinations which have been vaunted, and which together would cover many pages, show the rebelliousness of the complaint. It may be said of this as of so many diseases of the skin, that it is not new remedies which are wanted so much as the knowledge of the proper and successful application of those which have been found truly efficacious in the hands of others. It is well, therefore, to have a few good remedies and to endeavor to be skilled in their application, *with patience*, than to use the many which are recommended here and there, often by those of very small experience.

The principles involved in the treatment of ringworm are twofold. The first is to bring some remedy in contact with the diseased

portions which is inimical to the life of the vegetable parasite there, without being too harmful to the living animal tissues where it vegetates. Experimental studies have shown that various substances destroy the life of the fungi—such are mercury, iodine, sulphur, and many others—and the problem is to make them penetrate the hair and epidermis, both that outside and that within the follicles. The second principle is the exclusion of air, for it has been shown that the hyphomycetes are essentially aërobic, although they do also vegetate in liquid medium, as when a specimen is preserved in liquor potassæ and glycerin. In order to accomplish these ends, viz., the penetration of the parasiticide even into the depths of the follicle, when the latter is already filled by a diseased hair, and the choking the life of the fungus by excluding the air, various methods and measures are employed which require care in their execution.

The prime effort should be to reach every point or patch attacked by the parasite, at the earliest moment and in the most thorough manner possible. To do this it is necessary to cut the hair. But not only must the hair be cut on and around the diseased patch or patches, but, in order to treat it properly and also to lessen the ultimate area to be treated, the whole hair (except possibly a fringe around the margin) should be cut short, or even shaved, and be kept so. One is often greatly surprised, when this is done, to find that, instead of there being one or more patches, as was supposed, there will be a large number of larger or smaller spots where the fungus has already begun its ravages.

The child will have to wear some covering on the head, and it is well to have this made like a skull cap, fitting quite closely, of some light and inexpensive material which can be often renewed. In public institutions brown paper caps, like those sometimes worn by painters, answer very well, or they may be made of cheap muslin. Very thin gutta-percha tissue may be used inside the cap. It should never be forgotten that hats and caps which have been previously worn may contain the spores of the parasite, and may reinfect the scalp; the linings of these should be frequently changed. Children infected should be kept separate, as far as possible, from healthy children, and should certainly never use their hats, combs, brushes, towels, etc.

The spores and portions of mycelium of the trichophyton are exceedingly minute, $\frac{1}{1000}$ to $\frac{1}{600}$ of a line (.0021 to .0035 mm.) in diameter, and when dried are most readily transported from one part of the scalp to another, from one person to another, and, it is believed, can be wafted in the air as invisible dust. It is very important, therefore, that they should be prevented from escaping from diseased sur-

faces. For this reason greasy or oily applications (℞ Acidi carbolici, ʒ i.; olei olivæ, ʒ xx.), or those containing glycerin, should be kept on the scalp all the time, and it should never be allowed to become dry and scaly. Medicated applications should be thoroughly rubbed in at least twice daily.

There is some difference of opinion in regard to washing the scalp, and cases will also differ in the amount they will require and will stand. Some cases are benefited by being washed every day with tincture of green soap (℞ Saponis viridis, ℥ ij.; alcohol, ℥ i.) made into a lather with warm water; often every other day is sufficient, or even less seldom.

Immediately after the scalp is dried with heated towels (which should be *boiled* afterwards), the proper ointment is to be well *rubbed into* the affected parts for some minutes and a considerable amount left on the skin. This is often advantageously done with a soft tooth brush, but care may be necessary not to inflame the skin too much. As already stated, the remedies and methods which have been advocated are so numerous that it would be impossible to describe them all here. Mention will therefore be made of those known to be of service in the various forms and stages of the eruption.

First in regard to epilation. Theoretically this is a most valuable adjunct to treatment, but unfortunately it is a procedure most difficult to carry out in many cases. The hairs which most require epilation, the "stumps," will generally be found to be crushed by the forceps and to break off at the scalp, so that on some surfaces it is about as well to scrape the surface with a dull instrument, as the blade of the forceps or a knife. Epilation of hairs which are not much diseased is rather a painful process, and in very young or nervous children it is hard to carry out effectively. Nevertheless it is pretty well agreed by all that epilation is a necessary adjunct and it should be faithfully practised, and the physician should train the nurse in the procedure, and see that it is efficiently carried out. Not only should all the spots which appear to be affected be thus deprived of their hair, but a circle of from a quarter to half an inch wide should be cleared around them, for these hairs on the outside will soon become infiltrated with the spores and break off as the others have done. This epilation should be repeated as the hairs regrow, until the extracted hairs show no signs of the parasite under the microscope. In cases of any magnitude some epilation should be practised twice daily. The extraction of the hairs will not cause permanent baldness, whereas if neglected this may result from the disease.

It is quite as well not to attempt to epilate until the case has been submitted for a short time to treatment. The reason for this is that

sometimes the disease yields and this is needless, and also because the treatment often renders the hair less brittle. Later on mention will be made of a method of producing artificial and even pustular inflammation of diseased patches, whereby the hairs are greatly loosened, and may be extracted without difficulty. Some relief to the pain of extraction may be obtained by the free use of strong carbolized oil or glycerin (℥ i.–iij. to ℈ i.); also by cocaine, ten per cent., in equal parts of lanolin and vaseline, very well rubbed into the surface.

Fig. 43.—Forceps for epilation.

The best forceps to use is one with a broad, flat edge, not much serrated, that exhibited in the accompanying cut (Fig. 43) being especially serviceable. The pointed end is very valuable in selecting single affected hairs in cases of chronic disseminated ringworm. The hairs should be drawn with a slow traction, exerted in the direction of their growth. The ointment or special application should be rubbed in actively at once after a small patch is epilated, that the medicament may penetrate into the opened follicles, destroying any of the parasite which may have been retained in the remaining root sheaths. When there is an extensive surface to be epilated it may sometimes be done with adhesive sticks, as in the method described under favus. But this is pretty painful in ringworm, as the hairs around are not so loosened by the disease as they are in favus, and the stubbed and diseased hairs fully affected on the patches break off very readily without extracting.

In patches of recent ringworm, and in young children with tender skins, the following ointment will be found efficient, if thoroughly applied:

℞ Acidi carbolici, ...	gr. v.–xx.	.32	01.29
Unguent. hydrarg. oxid. rub., . .	℥ i.–ij.	3.88	7.77
Unguent. hydrarg. nitrat., . .	℥ i.–ij.	3.88	7.77
Unguent. aquæ rosæ, . . .	ad ℥ i.	ad	31.10

M.

Single patches may frequently be destroyed by tincture of iodine, well and repeatedly rubbed into the spot. The drying and hardening of the tincture may be prevented by the addition of a little glycerin (℥ i. to ℈ i.).

A combination of tincture of iodine, carbolic acid, and chloral, equal parts of each, introduced by Cutler, is a valuable remedy in many cases; but it should be applied with care by the physician

himself, and only a small area treated at once, at least until its effect on the skin is entirely understood. If there is much inflammation this is relieved by Lassar's paste (℞ Acid. salicyl. pulv., gr. x.; zinci oxidi, pulv. amyli, āā 3 ij.; vaselin., ʒ ss.) kept on all the time for a few days, when another thorough application of the paint can be made.

Coster's paste (℞ Iodi [in crystals], 3 ij.; oil of wood tar, or creosote, 3 vi.) is an old remedy, highly recommended by Alder Smith, Crocker, and other English writers.

The following ointment of iodine and mercury is a good parasiticide and penetrates the follicles well; but it is rather strong and may require dilution with vaseline, equal parts, more or less:

℞ Unguenti iodi,
Unguenti hydrargyri, ... āā ʒ ss. 15.55
M.

The tarry oils are often of great service, alone or in combination, as follows:

℞ Olei cadini, ...	3 ss.–ij.	1.94	7.77
Unguent. hydrarg. oxid. rub., . .	3 i.		3.88
Unguent. sulphuris, ...	3 ij.		7.77
Unguent. petrolat. (vaseline), . .	ad ʒ i.		ad 31.10

M.

℞ Olei cadini,
Olei olivarum, ... āā ʒ i. 31.10
M.

Oleate of mercury is a valuable parasiticide, but a little care is sometimes necessary lest salivation occur:

℞ Acidi carbolici, ...	♏x.–xxx.	0.64	1.94
Hydrarg. oleat. (20 per cent.), .	3 ij.–iv.	7.77	15.55
Unguent. petrolat. (vaseline), .	ad ʒ i.		ad 31.10

M.

Oleate of copper is well spoken of, in the strength of from one to four drachms to the ounce; this will often produce more or less of a pustular condition, when the hairs will be easily extracted.

Chrysarobin has been highly recommended by many, and certainly does act advantageously in some cases. But its disagreeable staining of the skin, hair, and bed linen, as well as its tendency at times to inflame the skin, especially about the eyes, are very great drawbacks to its use. It may be employed in a strength of from fifteen grains to a drachm in an ounce of ointment.

The difficulty in securing the penetration of the medicament by

means of ointments has led many to employ liquid preparations, such as turpentine, alcohol, ether, chloroform, benzol, etc., to remove the fatty matter in the tissues. Turpentine has especially been recommended to cleanse the scalp prior to painting thoroughly with tincture of iodine.

Bichloride of mercury and salicylic acid are the principal remedies which have been employed in solution. The former (gr. ij.–x. to ℥ i.) is certainly efficacious in destroying the fungus, but is rather dangerous for general use. Salicylic acid is destructive to vegetable life, and may be used in solution (℞ Acidi salicyl., ʒ i.–iv.; spiritus. vini rectif., ℥ ss.; glycerini, ℥ i.; aquæ, q.s. ad ℥ iv.) or in ointment (ʒ ss.–ij.). It is also valuable in collodion or liquor guttapercha (gr. x.–xxx. to ℥ i.) painted over and around the spot, after shaving.

In very chronic cases almost every remedy will seem to fail, and the black dots of hairs will be seen persistently filling the follicles, never protruding much beyond them. For these cases Alder Smith has most strongly recommended a severe treatment by means of croton oil, carefully applied, in such a manner as to transform the patch into an inflamed area, resembling the condition known as *tinea kerion*. This should be employed with great caution, and only by the physician; and, he states, not in children under six or seven years old, unless under very exceptional circumstances. He applies it over a small surface at once, less than an inch, and has a poultice firmly tied on over it. By the next day a pustulation ensues, which can be again repeatedly painted and poulticed for several days until the surface becomes swollen, boggy, and tender, and each hair is loose in its follicle: the hairs then come out very easily, either on removing the crusts or they can be removed singly with the point of the forceps. If carefully done this usually results in the cure of the diseased surface, and the hair regrows in a healthy condition, but sometimes permanent baldness ensues. For a fuller description the reader is referred to Dr. Smith's admirable book.

In cases of *disseminated ringworm*, where the hair has mainly regrown with only single scattered, diseased "stumps" here and there, it will often be extremely difficult completely to eradicate the disease. And yet the attempt should not be neglected, because of the constant menace which the child presents to those around, for many an epidemic of ringworm in a school or institution has started from such a case. In these cases Smith recommends searching out each stump, extracting it if possible, or at least treating it with a drop of croton oil, which may be well inserted by means of a wooden tooth pick dipped in the oil and slightly bored into the follicle. It is to be

remarked, however, that experiments have shown that croton oil itself is not destructive to the life of the trichophyton, which can grow, when immersed in it, in the laboratory. The destruction of the fungus results from the pustular inflammation set up, the pus being inimical to the life of the parasite, so that, in order to be effectual the treatment must produce pustulation. In these cases of disseminated ringworm, therefore, some general antiparasitic treatment should be continuously adopted for a long time. Such would be inunctions twice daily with mild oleate of mercury or carbolized ointment, and frequent shampooing with the green-soap tincture, to which some carbolic acid or bichloride of mercury has been added (℞ Hydrarg. bichloridi, gr. x.–xx.; saponis viridis, ʒ ij.; spiritus vini rectif., ʒ i. M.).

In paying so much attention to the local treatment of scalp ringworm, the proper internal, general, dietetic, and hygienic treatment should never be neglected. As moss does not flourish on the bark of perfectly healthy trees, with plenty of proper plant food and abundance of air and sunshine, but rather on those which are suffering from lack of nutrition and tending to decay, so vegetable parasites, which are moulds or fungi, seldom flourish long upon individuals in the most perfect health. This has been repeatedly shown by failures in attempts at artificial inoculation.

It would be impossible here to enter fully upon this matter, which should, however, be seriously considered by every one called upon to treat this class of cases. It is not enough simply to prescribe this or that tonic; nor, indeed, is there any specific which can be relied on to strengthen the tissues against the parasitic growth. But every element which conduces to the healthy life and vigor of the individual should be taken into consideration, and the nutrition should be improved to the highest degree attainable.

Prognosis.—As may be seen by what has preceded, the prognosis of ringworm of the scalp varies immensely in different cases. While the disease is certainly curable, it is extremely difficult in any given case to foretell what will be the result as regards the duration of the disease, as so much depends on the care and fidelity with which even the most proper treatment is carried out. It may be said that very few cases, even those which are quite recent, are cured in a month; more frequently three to six months is an average time, while some cases, even in skilful hands, may take years if the disease has obtained a strong foothold. Alder Smith knew of one case which had resisted all treatment for nine years, and though the patient, at the time of writing, was eighteen years old, he still had disseminated ringworm. Crocker speaks of a woman of twenty who

had had the disease since she was ten years of age, disseminated all over the head. Most writers agree that accounts of the very rapid and certain cures of ringworm of the scalp spoken of were either in cases where previous treatment had largely destroyed the disease, or were instances of faulty observation. All who see much of the disease see many patients who have been regarded as cured by other practitioners and yet on whom there is still an abundance of the parasite to be found microscopically.

4. Tinea Trichophytina Barbæ.

Synonyms.—Tinea sycosis; sycosis parasitica; parasitic sycosis; ringworm of the beard; barber's itch: Fr., *Trichophytie sycosique;* Ger., *Parasitäre Bartfinne.*

In the earliest stages ringworm of the bearded parts resembles that of the body more than it does that of the scalp; indeed, in many features it is quite different from the latter, especially in its greater tendency to exhibit inflamed lesions, and in the relatively slight proneness of the hairs to break off. The difference probably lies in the greater resistance to the attack of the fungus offered by the strong adult hair. The eruption is really at first a circinate, epidermal disease, which penetrates the large follicles later and attacks the hair only secondarily, after its life and vigor have been affected by the derangement of nutrition produced by the follicular disease.

Accordingly the eruption in this locality commonly begins with a superficial red point, enlarging, as in body ringworm, until it forms a distinct ring, often with an inflamed surface, more or less scaly, which may be the seat of vesicles or pustules. More commonly a second or third point will similarly develop near by, and these then will coalesce. These rings will frequently extend beyond the bearded area to the adjoining skin, and thus form a valuable diagnostic mark between this and ordinary inflammatory sycosis, and eczema.

But if unchecked the disease does not long remain in this superficial form. Very soon the follicles will show signs of deep-seated inflammation, and the tissues where the beard is seated will become swollen and raised, give a "boggy" sensation when touched, and may be very painful. The extent of the inflammation varies greatly in different cases, from a moderately reddened and swollen tissue to one raised greatly in lumps or bosses, tending to become covered with a purulent crust. When pressed upon, a little sero-purulent, glairy, glutinous fluid exudes, but in some cases the discharge may be more like ordinary pus. In these cases there is commonly very considerable burning pain and some itching.

Usually it is impossible or very difficult to shave over these inflamed areas, and the beard will be found clipped short and standing out prominently from the reddened surface, unless it has already been epilated or fallen spontaneously from the disease. In older cases there will be areas which have thus become more or less bald, giving the whole surface a very ragged appearance.

The ease with which the hairs come out, when the disease is severe, is one of the characteristic features of the eruption. The hairs appear as if only stuck into so many holes, and may be withdrawn without pain, and are often removed on wiping the surface. On the outer edge, where the part is less affected, they adhere, and epilation may be painful. As the hairs are removed their roots are found to be large and succulent, the root sheaths being infiltrated with inflammatory exudation. The hairs are blackened and dead-looking, often bent and distorted, some of them having been broken off, as in ringworm of the scalp, with brushed ends; but as a rule they are not so much disintegrated as in that affection.

This typical form of parasitic sycosis is not, however, always seen. In many cases the eruption runs a very mild but obstinate course. The external manifestations of the eruption may be very light, and yet the disease continues much as in disseminate ringworm of the scalp. There will then be single small, congested points here and there, and individual hairs will be affected, showing the parasite microscopically for a long time. The eruption is apt to be much worse on the chin (whence the name *mentagra*) and in the submaxillary region.

Etiology.—That parasitic sycosis is caused by the trichophyton was shown by Gruby in 1842, and is constantly demonstrated by clinical facts. The adjoining rings are those of ordinary ringworm, and the disease is now and then traced directly to this eruption elsewhere on the body, or to others thus affected, as also to animals. Most commonly, however, it is contracted from shaving in the barber shop. It is not thought that the fungus is communicated by the razor, but by the lather-brush, towels, the hands of the barber, etc. Parasitic sycosis is seldom seen where the beard has always been allowed to grow.

This form of trichophytic eruption is not very common, for adults resist the invasion of the parasite; also, individuals vary in their susceptibility to its attack, and undoubtedly of many shaved at the same barber's shop very few would become infected. Of the cases occurring in the writer's private practice, one-half were between twenty and thirty years of age. Statistics show that a larger proportion of cases is seen in private than in public practice.

Pathology.—The inflammation excited by the parasite in ringworm of the beard forms an important feature in the eruption, as it involves the whole follicle and the tissues around. The boggy masses, however, never contain any amount of pus, although sometimes they may almost give the sensation of fluctuation. The gummy and rather gelatinous character of the discharge from the follicular openings is owing to the altered secretion from the large sebaceous glands present in this region, which have been involved in the inflammatory process.

The parasite gains entrance as in the case of tinea tonsurans, already described, and the scales and affected hairs appear much the same as in that disease (Figs. 41 and 44). The fungus is sometimes rather difficult to find, if the worst and most loosened hairs are taken ; it should rather be sought for in those from the advancing edge. Sabouraud, as already mentioned under ringworm of the head, believes that parasitic sycosis is produced by one special variety of trichophyton, the *T. megalosporon pyogena* of the horse. Clinical experience, however, has repeatedly shown that this form of eruption is constantly contracted from and again produces in others the ordinary forms of ringworm of the body and scalp.

FIG. 44.—Hair from Tinea Trichophytina Barbæ (parasitic sycosis) showing Mycelium and Spores).

Many erroneously suppose that the white, succulent mass surrounding the root of a hair extracted from an inflamed patch on the face is evidence of a parasite. This is not at all necessarily so, for to the naked eye the hair taken from a patch of ordinary sycosis or eczema may not differ from that removed from one affected with trichophytic disease; the microscope alone can determine whether fungus is present or not.

Diagnosis.—The diagnosis of tinea barbæ is made from the history of the case, from the commonly ringed character of some portion of the eruption, the peculiar knotty or bossed character of the inflamed lesions, the looseness of the hairs over the affected area, and the presence of the parasite microscopically.

The eruptions liable to be confounded with it are ordinary *sycosis*, *eczema*, *acne*, and *syphilis*. The ordinary (or *coccogenic sycosis* as now called) differs from the eruption under consideration in having

separate pustules, often scattered here and there, each penetrated by a hair; the boggy succulent masses are not formed; the hairs adhere firmly until they have been for some time surrounded by pus; it is confined wholly to the hairy parts; it is very apt to be symmetrical and also to invade the lip and cheeks rather than the chin. *Eczema* of the beard exhibits much the same characteristics, and also generally extends beyond the hairy parts, and commonly itches much. *Acne* nodules never form the succulent masses with loosened hairs seen in this complaint. *Syphilitic lesions* of these parts would also appear quite different from ringworm, and would usually have other concomitant signs.

Treatment.—In the earlier stages mild parasiticides, as already described, check the progress of the disease, but generally it will be found that the hairs and follicles are already invaded and epilation is necessary; this is always required when the eruption has become severe. Fortunately this is not so difficult of accomplishment as in ringworm of the scalp, and the large hairs of the beard can generally be extracted with their roots; as already explained, these come out easily, as a rule.

The patient should be instructed to epilate a portion of the surface every day, even twice daily, and to make the application thoroughly at once thereafter. In the later stages it will often be necessary for the physician himself to remove the isolated hairs which are affected. It is surprising to see how quickly the inflamed and boggy masses will subside when the irritating hairs are extracted and proper remedies are applied. The surface should never be poulticed, nor is it ever necessary to lance the lumps. Some advise shaving every other day, but the present writer prefers to have the beard kept very short with the scissors, that epilation may be more thoroughly practised; the short hair also serves to keep on more of the ointment. When the eruption is well under control shaving may be practised, and many isolated seats of disease will be seen as red points round the hairs; the latter may then be left to grow until epilated.

The local applications must vary with the condition present. Most of the combinations already presented under the other forms of trichophytic disease are of value. The following ointment is of great service:

℞ Acidi carbolici, ...	gr. v.–x.	0.32	0.64
Acidi tannici pulv., ...	ʒ ss.	1.94	
Glycerit. tannini, ...	ʒ ss.	1.94	
Sulphur. præcip., ...	ʒ ss.–ij.	1.94	7.77
Unguenti aquæ rosæ, . . .	℥ i.		31.10

M.

This may require to be strengthened, as by the addition of a drachm or two of the red oxide of mercury ointment, in more chronic cases.

The ointment should be put on very thoroughly at night, or rather, as early in the afternoon as possible, and left on as much of the time as is feasible. During the day a thin film of the ointment can be worn without disadvantage.

When there are many inflamed lumps, soaking of the face with hot water and borax, by means of a cloth, will help reduce the inflammation, after which the ointment should be immediately reapplied. If the ointment cannot be worn at all in the daytime, the face can be thoroughly bathed with a solution of hyposulphite of soda (℥ ij.–iv. to ℥ i.), and a dusting powder (℞ Acid. salicyl., ʒ i.–ij.; pulv. talc., pulv. amyli, āā ℥ ss.) thoroughly applied; or better, this latter can be dusted over a thin film of ointment. Bichloride of mercury in a lotion (℞ Hydrarg. bichlor., gr. v.–xx.; spts. vini rectif., ʒ iv.; glycerini, ʒ iv.; aquæ rosæ, ℥ iij.) acts very well as a lotion after epilation and for treatment during the day.

Prognosis.—Parasitic sycosis is a curable disease, but unless the true cause, the parasite, is recognized and properly treated, the eruption may last for years. Even in moderately severe cases it may require several months of good treatment before the disease is thoroughly eradicated. The beard should not be allowed to grow until the microscope fails to reveal any traces of the parasite.

5. Tinea Trichophytina Unguium.

Synonyms.—Onychomycosis; ringworm of the nail.

This rare condition of the nails is most commonly found in those who are actively engaged in treating patients with ringworm, and also in those with the disease elsewhere; but considering the large number thus affected, this form of trouble is very infrequent. In private practice the writer has recorded but four cases among ten thousand miscellaneous skin cases, and a not very much greater proportion in public practice, even including the hospital nurses who are constantly caring for ringworm patients. Crocker records no cases among ten thousand in public and two thousand in private practice; nor Anderson among ten thousand public and one thousand private cases.

The nail invaded by the parasite first becomes yellowish, dirty, and friable at its free extremity, and beneath it a certain amount of dry epithelial debris is formed, which can be but partially removed. As the disease progresses, more commonly along the sides of the nail-bed, the nail is seen to be streaked with yellow and loosened from its seat. With the further progress of the disease the anterior portion

of the nail grows more and more thickened, and as the free portion crumbles or is cut off, it appears raised from its bed and many times its normal thickness. The natural color is lost, and what remains is of a dirty yellowish hue, with streaks and fissures. The outer layers of nail cells seem to retain their vitality, the parasite penetrating and disorganizing the nail beneath them.

The progress of the disease is very slow. Beginning only as a slightly dirty appearing condition of the free margin of the nail, the disease may not be recognized until it has quite reached the part adherent to the nail bed, and until there are some streaks indicating the penetration of the parasite much further along the nail. There is seldom any inflammatory action in ringworm of the nail, only the slow, dry disintegration of the nail substance by the parasite. The disease is extremely rebellious to treatment owing to the difficulty of reaching the fungus in the dense structure of the nail.

It is rare for more than one or two nails to be attacked at once, and those commonly on the hands; the right hand is naturally more liable to the disease. It is possible for many nails on the hands, or even those on the toes, to be attacked when there is very general ringworm, but this must be exceedingly rare.

Etiology.—From the relative infrequence of ringworm of the nail even in those who have the eruption elsewhere, or in those exposed to the parasite, it is evident that all are not equally subject to its attack in this locality; there is probably some unknown weakness of tissue which allows of the penetration of the fungus beneath and into the nails. Neglect of proper precautions after handling ringworm cases favors the disease. Three of the four cases in the writer's private practice were in women, aged twenty-two, forty-three, and fifty respectively; the fourth case was in a gentleman, aged fifty, who had ringworm of the crotch (eczema marginatum). Two female nurses in the New York Skin and Cancer Hospital were also attacked by parasitic disease of the nails.

Pathology.—The fungus both enters the free, cut end of the nail, and also penetrates and vegetates in the furrow beneath it. The progress of the disease, however, is mainly in the structure of the nail itself. The horny cells become separated from each other by the ingrowing mycelium and lose their cohesion; the elasticity of the nail is thus lost and it crumbles. But this disintegration of the horny tissue is not at all comparable to that observed when the trichophyton attacks the hair, a somewhat similar structure. The fungus steadily seeks to attack new tissue and tends to advance towards the insertion of the nail in streaks, which more or less crack open and can be scraped out with comparative ease.

If very thin portions cut or scraped from the nail are placed in equal parts of liquor potassæ and glycerin, and allowed to soak for a while, the trichophyton fungus may be seen penetrating between the nail cells, mainly in the form of mycelium (Fig. 45). The branched and rather short-jointed tubes are here observed traversing the field between the large, flat nail cells, and very few spores, or conidia, can be found.

Fig. 45.—Section of Nail in Tinea Trichophytina Unguium, showing Short-jointed Mycelium.

Diagnosis. — Some writers have stated that this affection of the nails is clinically indistinguishable from that produced by psoriasis, eczema, and other general diseases; but close observation should certainly mark many differences. As before stated, it is rare that more than one or two nails are affected by the parasite, whereas in other diseases this is the exception. In *psoriasis* especially a number of the nails, both of the fingers and toes, are liable to be affected to varying degrees. The parasitic disease begins at the free extremity with a yellowish degeneration, thickening the nail and producing the discolored streaks down its surface. In psoriasis the end of the nail is apt to be thin, breaking off easily to the quick and splitting, and on nails less affected the surface will present small pits or depressions. Nails affected in *eczema* are commonly thick and more or less distorted, either at the base or free extremity, and are not so crumbling and brittle as in the parasitic disease. General *onyxis* may present a stubbed and brittle condition of the nails, of a yellowish-gray color, much resembling parasitic disease, but the affection is generally mul-

tiple, many or all of the fingers and toes being affected. The many other changes of the nails accompanying *pityriasis rubra, syphilis, leprosy*, etc., as well as idiopathic or traumatic alterations cannot be entered upon here; all have features which are more or less characteristic and should distinguish them from those produced by the parasite.

Treatment.—When once the parasite has involved the nail at all deeply the treatment is most troublesome and tedious; it is questionable if evulsion of the nail, under ether, followed by proper antiseptic treatment until it is fully regrown, would not be the wiser course. Even under intelligent and diligent care the disease may last for many, many months, and if neglected there seems to be no tendency to cure; for the continual new growth of the nail affords fresh pabulum for the parasite.

Scraping forms an important part of the treatment. This should be practised daily in the affected places, a strong sharp-pointed knife being used to follow down the streaks of disease in the nail, and by removing the outer, firm portion, to allow the parasiticide to reach the disorganized tissue. It is necessary to keep any application in contact for a long time, owing to the difficulty of penetration. The solid preparations of mercury and sulphur which are in particles are of no use, and recourse must be had to parasiticides in oily or liquid solution.

The oleate of mercury, in ten- or twenty-per-cent. strength, forms one of the best applications, also the mixture of mercury and iodine ointments, equal parts, diluted if too irritating. These should be worn on the affected part, covered with a bit of cotton wool and finger tip all the time. Solutions of bichloride of mercury (gr. ij.–v. to ℥ i.) applied hot, also answer well. Crocker recommends highly Harrison's treatment by means of a combination of mercury and iodide of potassium in solutions, used one after the other, as follows: After scraping the nail, solution No. 1 (℞ Potass. iodidi, ʒ ss.; liquor potassæ, aquæ, āā ℥ ss. M.) is applied by means of lint beneath oiled silk (gutta-percha tissue is better) for fifteen minutes. Then solution No. 2 (℞ Hydrarg. bichlor., gr. iv.; spts. vini rectif., aquæ, āā ℥ ss. M.) is immediately applied in the same manner for twenty-four hours. The nail is then scraped again and both applications are repeated. If the finger becomes too irritated milder measures must be used for a while. Sulphurous acid (freshly made, as recommended under tinea cruris) kept on with absorbent cotton under gutta-percha tissue is also good treatment; likewise hyposulphite of soda (ʒ ij.–iv. to ℥ i.) applied in the same manner.

Prognosis.—While this is certainly a curable affection, it will require much patience and perseverance on the part of the patient and

physician to effect a perfect cure, and to have the nail restored to a condition of health.

The fungus of tinea favosa, or *favus*, to be described later may also attack the nails, but the clinical features of the disease are not essentially different from those just described. The treatment would also be the same.

II. Tinea Imbricata.

Synonyms.—Herpes desquamans; Tokelau ringworm.

This form of vegetable parasitic eruption is prevalent in certain islands of the Pacific and in China, and was long thought to be identical with trichophytic disease; but the writings of Turner, Königer, Manson, and McGregor have established it as quite distinct, both in its clinical features and in the microscopic character of its fungus. It has received various local names in the islands where it has been observed: *Bowditch Island ringworm, lafa Tokelau, le Pita, Gune, Cascadöe*, and *Buckwar*. It is possible that further studies may yet recognize other similar affections peculiar to certain countries.

The eruption "commences with inflamed circular patches, which extend, coalescing with neighboring patches, become scaly and very itchy, and ultimately, unless its progress is arrested by treatment, the whole surface of the body becomes affected. The scales are arranged in concentric circles, in spirals, or in irregular curves about a quarter of an inch apart. The scales stand out free, being only attached by one edge to the skin." When fully developed it resembles ichthyosis in its general appearance, but the scales differ from those of ichthyosis in that they are not regularly disposed in squares, but in concentric circles. The scales are arranged so that the free border of each is towards the centre of the circle or system of circles to which it belongs. The skin underneath the scales is paler than the general surface, but darker where the scales are attached in the line of the advancing parasite.

FIG. 46.—Fungus in Epidermic Scale from Tinea Imbricata. (After Manson.)

According to the inoculation experiments of Manson there is an incubation period of nine days; the epidermis is then elevated by a brown mass, and when about half an inch in diameter the centre gives way,

leaving a fringe of epidermis around the central opening; soon another brown point appears in the centre which goes through the same process, each ring enlarging in size, and this is repeated many times. Other foci of infection may appear, the sets of circles become confluent, and ultimately large areas are covered or even the whole body. There is very little inflammation of the skin ever seen, but it is attended with heat and intense itching.

Etiology.—The disease seems to be endemic to hot countries and the fungus appears to require special conditions for its development. It is very contagious and will often spread through a family; it attacks both sexes and all ages, and in some of the Pacific islands half the population is said to be affected.

Pathology.—The fungus closely resembles the trichophyton, but differs from it in several respects. It attacks the epidermis almost exclusively, rarely affecting the hairs. The parasite is exceedingly abundant as compared with that found in trichophytic disease. The spores, or conidia are generally oval, rarely round, often irregular, measuring from $\frac{1}{10000}$ to $\frac{1}{5000}$ of an inch in diameter, arranged in single rows, or in long, often branching chains (Fig. 46). The mycelium varies in breadth from a very minute thread up to $\frac{1}{5000}$ of an inch. It appears to be of two sorts, a paler and a darker, though intermediate forms can usually also be found. Dr. Manson demonstrated by inoculation experiments that the fungus of tinea imbricata always produces that disease, whereas the fungus of *tinea trichophytina* inoculated on the same patient in a different locality caused its own eruption, quite different in character.

Diagnosis.—*Ichthyosis* and *tinea circinata* are the only diseases which would be likely to be confounded with this eruption; but with the distinctions which have been already presented there should be no difficulty.

Treatment.—Sulphur ointment was found by Turner to be a specific for this eruption, and he treated very many cases with it. Manson recommends a linamentum iodi, double the officinal strength, to be applied successively to various portions of the body. As the fungus is very superficially located and very abundant and easily disseminated by the excessive scaling, relapses are frequent from reinfection from the clothing.

III. Tinea Versicolor.

Synonyms.—Pityriasis versicolor; dermatomycosis furfuracea; chromophytosis; chloasma (of older writers); Ger., *Kleienflechte.*

Tinea versicolor, like the eruption last considered, flourishes very

freely in warm climates, but occurs also in this country with more or less frequency. In one part of India it was found in four per cent. of two thousand five hundred and forty prisoners in jails; in another district it was spoken of as present in a very much larger proportion. The fungus does not flourish so luxuriantly in this country, and the disease formed a little over one per cent. in the statistics of the American Dermatological Association, and hardly one per cent. in the writer's cases in private practice, before alluded to.

As in the case of other affections due to vegetable parasites, the eruption begins with a very small punctate spot, which steadily enlarges, generally in a circular form; but, unlike trichophytic disease, the patches do not tend to clear in the centre, but form an evenly spread surface as long as it exists.

The color of the skin affected by the parasite is from first to last about the same in most cases—namely, of a yellowish fawn, or washed-leather color; but it may be of a reddish hue, or even, in rare cases, of a rather brown color. The affected surface has a peculiar velvety feeling, and if not already presenting scales, it may readily be made rough and scaly by very slight scraping. The eruption is very superficial, and sometimes the discolored and diseased epidermal layer can be almost entirely removed by scraping, and the skin will appear quite normal beneath. The edges of the patches are sharply cut and rounded, generally standing out quite sharply in contrast with the healthy skin. There is little if any sensation connected with the eruption, except a very moderate itching in certain cases, especially when the patient is overheated.

The most common seat of the eruption, when there is but little, is over the sternum or scattered over the front of the chest, and the back is generally affected at the same time, though to a less degree. But when extensive the eruption may cover the entire trunk with its scattered or conjoined patches, as also the limbs and neck up to the exposed portions; in rare cases it may even extend on the backs of the hands and on the lower part of the face. It has also been observed on the forehead, and Payne found this parasite in the scales from the scalp and beard, in a man who had had tinea versicolor of the body for some years. Generally the patches are of various sizes, even up to several inches in diameter, often coalescing into larger areas. In certain rare cases the eruption will not tend to spread thus, but there will develop innumerable, small, round points, perhaps none of them larger than a split pea, and separated one from another. In these cases there may be more redness, and the diagnosis will be difficult; but slight scraping will raise the branny scales, and in them the fungus will be abundantly present.

Etiology.—While tinea versicolor is undoubtedly due to a vegetable growth on the skin, and this always comes from without, the disease is apparently but slightly contagious. It is relatively rare to find husband and wife both affected, nor is it common in many members of the same family. There seems to be some as yet unknown predisposition, or suitability of soil for the fungus to grow; it appears both in those exhibiting the most perfect and robust health, and in those much debilitated, as by phthisis. At one time it was thought that it had something to do with the latter trouble, it was so frequently found in those thus affected. But the explanation of the apparent frequency is found in the fact that these patients are apt to perspire frequently and so encourage its growth, and also in the fact that they are so constantly submitted to physical examination of the chest, when the eruption would be discovered; for patients often will have it present for some time, indeed until it has attained very considerable development, before it is noticed.

The eruption is undoubtedly favored by dampness and heat, and in India, where it was found so frequently in inmates of jails, it is often charged that the eruption appears only after incarceration. Those reporting this claim state that it is quite possible, as the natives seldom wear covering over their bodies when free, but in jails they are obliged to wear jackets. This agrees also with the natural history of the eruption, which rather avoids parts exposed to the light and air. It affects both sexes, but in the author's private practice it appeared in men three times more frequently than in women; the largest number of patients were between twenty and thirty years of age. It rarely occurs before eighteen or twenty years of age (but has been observed as early as eight years) and is not common after fifty years of age.

Pathology.—The parasite is situated in the outer layers of the epithelial cells, but may penetrate into the lanugo hair follicles; it does not, however, attack the hair as does the fungus of trichophytic disease and favus. The parasite, the *microsporon furfur*, was discovered by Eichstedt in 1846, and is one of the easiest of demonstration, being found very abundantly in the superficial scales which are readily scraped off. The scales from any patch which has been untreated are scraped on a slide, on which a drop of liquor potassæ and glycerin has been placed, and mixed with it; a cover is then lightly pressed down over the whole. The parasite then appears (*Fig. 47*) as fine threads running across the field, of even contour and more or less branched, with rounded extremities. The conidia or spores, which are the most striking feature, are always seen in groups or masses, suggestive of bunches of grapes.

Diagnosis.—The diagnosis should seldom be difficult if due regard is paid to the clinical features of the eruption, and the microscope will always decide when there is any doubt. The eruptions likely to be confounded with that under consideration are: *eczema seborrhœicum* (or seborrhœa corporis), *pityriasis rosea*, *leucoderma*, *chloasma*, the *pigmentary* and *circinate syphilide*, *tinea circinata*, and *erythrasma*.

Seborrhœic eczema also commonly occurs on the chest and back, but the circular patches are more reddened and sharply defined, and

Fig. 47.—Epidermis Scale from Tinea Versicolor, showing Mycelium and Groups of Spores.

generally cleared in the centre; there is also generally much more itching.

Pityriasis rosea is apt to begin on the neck and top of the shoulders and to spread downwards, and seldom if ever begins in the middle of the chest. Its lesions are of a pink color, deadening in the centre, and its surface does not prevent the even, buff hue and velvety feeling belonging to tinea versicolor.

Leucoderma, or vitiligo, is quite a different affection, characterized by white patches surrounded by a sharply defined, brownish-yellow discoloration; the discolored areas in tinea versicolor are convex on their border, those of leucoderma concave. The surface of leucoderma is smooth, with no scaling, nor can any be raised with light scraping.

Chloasma proper is a pigmentary affection, whose patches, of a

darker brown and quite different hue, occur mainly on the forehead and face, regions commonly spared by tinea versicolor.

The *pigmentary syphilide*, a rare condition, is manifested mainly on the sides of the neck, and resembles leucoderma. The early *circinate syphilide* is sharply defined, red, clears in the centre and will usually have other accompanying signs of syphilis. It must be remembered that tinea versicolor is not uncommon in syphilitics, and is often found (even when the patient has not previously noticed it) when the body is stripped for examination, and thus it is not infrequently mistaken for one of its manifestations; the brownish buff of the tinea versicolor has frequently been suspected to be the conventional "copper color" so often erroneously attributed to syphilitic lesions.

Some very superficial and diffused cases of *tinea circinata* may slightly resemble tinea versicolor; but the sharply defined, reddened, advancing circles, clearing in the centre, are quite different from the buff, slightly scaly surfaces of this eruption.

Erythrasma is located mainly in regions where two surfaces of the skin are adjacent, the inguinal and crural region, the axillæ, etc., and never on the chest; the color is darker, and the microscopic appearances are quite different.

Treatment.—The eruption yields readily to antiparasitics, but it is very apt to recur unless the treatment has been thorough and persistent, and unless the underclothing is especially treated, either by very particular boiling or by disinfectants.

The parasite being located very superficially it is easily removed by mild measures. The repeated warm bath, with plenty of soap (preferably the coarse laundry soap) will remove much of the affected epidermis, and open the way for the action of the parasiticide. The simplest and cleanest treatment is with the hyposulphite of soda in solution (℞ Sodæ hyposulphit., ʒ vi.; glycerini, ℥ ss.; aquæ, q.s. ad ℥ vi. M.) and if well used rarely fails. This should be well rubbed over the surface with white flannel directly after the bath, and also night and morning. Weak bichloride of mercury solution, also salicylic acid (℞ Acidi salicylici, ʒ vi.; spts. vini rectif., ℥ i.; glycerini, ℥ ss.; aquæ, q.s. ad ℥ viij. M.) will prove effective. When the eruption is very extensive a few sulphur vapor, or mercurial baths, followed by free inunction with carbolized vaseline (gr. v.–x. to ℥ i.) will act promptly.

Prognosis.—This is always good, except that there may be a tendency to recurrence if any of the parasite has been left in the deeper layers of the skin or follicles. Reinfection is always possible from the underclothing, either that which has been previously worn, or even by fresh garments which have been submitted to a public laundry.

IV. Tinea Favosa.

Synonyms.—Favus; porrigo favosa; crusted ringworm; Fr., *Teigne faveuse;* Ger., *Erbgrind.*

Favus is as yet a relatively rare disease in this country, but is on the increase owing to the constant importations of fresh cases from the countries where it is more prevalent, which cases in turn become fresh foci of infection. Also, as the disease is, of course, totally unchecked among the animals apt to be infected and from which it is frequently acquired, the number of human cases must also increase. In Poland it is said to be fully as common as is the ordinary ringworm with us; it is also very frequent in Russia, Hungary, Italy, France, and also among the poor in many countries where it is the custom to keep the head much bound up, and where cleanliness is neglected. It is fairly common in Scotland, where Anderson reports 156 cases among 10,000 patients in hospital practice, but is extremely rare in England, Crocker reporting no cases among 10,000 seen in public practice, and but 1 case among 2,000 private patients. In this city it is not very infrequent, as also in Boston, especially among the poorer classes. During ten years there were 103 cases of favus among 12,890 patients at the New York Skin and Cancer Hospital, the disease forming 0.8 per cent. of the whole; but among 10,000 skin cases in the writer's private practice it occurred only six times, forming 0.06 per cent.

The disease may affect any and every portion of the body, and has even been known to attack the mucous membranes of the stomach and intestines. But its favorite habitat is the hairy scalp, and here it exhibits its greatest intensity and does the most damage, often leading to baldness of the areas affected.

Favus of the Scalp.

Like the other vegetable parasitic eruptions the individual lesions of favus develop from single points where the fungus has gained access, and each spot increases peripherally to a certain extent, but with marked differences from those previously described. While the others develop until a relatively large area may be covered from a single site of infection, the fungus of favus tends to heap up, and the mass thus formed is seldom over one-third of an inch in diameter, while it may be raised almost a quarter of an inch above the surface. This mode of growing of the parasite results in the formation of separate, round, cup-like masses, called *scutula* or *favi*, of a sulphur-yellow color, which are pathognomonic of the disease.

These begin exceedingly minute, and may sometimes be detected with a strong lens when they would not otherwise be suspected. These "favus cups" or "favi" are usually penetrated by one or more hairs, and are found to be very superficially situated, being partially embedded in the epidermis, and can be readily lifted from their seat. Their under surface is then found to be convex, smooth, and shiny; the upper surface is concave and more or less rough, with remains of the epidermis, beneath which it has burrowed, still attached around its edge. The seat or base from which it is lifted is a little depressed, of a bright red-color, and perhaps bleeding slightly; this depression soon fills up and becomes covered with a scaly layer, from which a new favus cup may form.

The single cups of favus do not, however, remain long isolated, for others soon develop near-by, and they coalesce so as to form areas even of some size, often several inches in diameter; if unchecked the disease may extend so as cover the entire scalp. Nor do they very long retain their perfect form and color; for as the eruption persists and increases the crusts merge into one another, the outer surface becomes detached or flakes off, and the sulphur-yellow color is more or less lost. The masses may then either become darkened by dust or applications which have been made; or, when there is a patch of some size, its surface may become whiter and uneven, covered with an exuberant, mortar-like growth of the parasite, which readily crumbles and becomes detached.

The fungus not only grows freely on the surface of the scalp, but also penetrates downwards into the hair follicles and affects the hairs themselves. These lose their lustre, become harsh and more or less brittle, and frequently split. They do not break off, however, as in ringworm, but generally remain of some length, until they fall out from disease or are pulled out. The penetration of the fungus causes an œdematous swelling of the root sheaths, and the hairs are easily extracted with some of them attached, forming large succulent masses. This process within the hair follicles ultimately leads to their destruction and to atrophy of the skin, so that the hair is no longer produced and the affected portion may remain permanently bald.

The bald surfaces of favus resemble somewhat the cicatrices produced by any superficial ulceration. In the sharply defined areas the skin is thin, depressed, and shiny, presenting a marked contrast to the adjoining healthy portions; for a while after the disease process has ceased it is red, but later becomes peculiarly white and glistening. In some instances there will be islands, large or small, of healthy skin, growing large, strong hairs, and occasionally single stiff hairs may be found which have escaped destruction; but as a

rule the individual hairs will be found sooner or later to be affected and to be easily extracted from the slightly reddened area which surrounds them.

There is rarely any amount of inflammation of the skin connected with the presence of the parasite, and none which is at all comparable to that of the trichophyton in kerion and sycosis. But close inspection will commonly show some congestion and redness round all affected hairs, and sometimes there is a little pus found beneath the favus cups; in old, chronic cases there are pustules formed about the scattered hairs which have escaped removal or destruction. The disease does not ordinarily give rise to any pain, but there is more or less itching attending it. This latter will sometimes be the first symptom to attract attention, and lead to the discovery of the *scutula* or "favus cups," which may already have attained some size. When the disease is fully developed there is a peculiar musty or "mousey" odor which is quite characteristic.

Favus of the scalp is an exceedingly chronic and rebellious affection, having really no tendency to spontaneous recovery until every hair on the head has been attacked and destroyed. Beginning in childhood it may last, if unchecked, quite to adult life, and even under such medical care as is often given, it may remain many years before being completely eradicated. It is not a little curious that favus seldom if ever attacks the bearded face; the writer has never met with it and does not know of any recorded cases.

Favus of the Epidermis.

The development of favus on the epidermis may be easily studied by means of artificial inoculation, as has been done by the writer. A portion of the crust from favus of the scalp was ground up with a drop of water and well rubbed into the skin of the forearm, the part being covered with a watch crystal held in place by bands of adhesive plaster. For two weeks nothing was seen, but by the end of the third week the surface presented some superficial scaling in circles, slightly reddened, somewhat resembling ringworm, but no trace of the "favus cups." Some of the scales examined microscopically then showed spores and branching mycelial threads in and among the epidermal cells. It was not until nearly six weeks later, or eight weeks after inoculation, that distinct scutula were observed; there were then a number of most perfectly formed, minute, yellow cups, the size of the head of a large pin, and around them a scaly erythematous halo.

The epidermic lesions of favus may come singly on any portion

of the body, and even on the face, of which the writer has seen a number of instances, as also on the scrotum and penis, where there were a dozen or more minute cups; likewise on the knees, buttocks, etc. In some of the instances the eruption resembled body ringworm greatly, and the diagnosis could be made only by the aid of the microscope. A number of instances have been reported, and some have occurred in the New York Skin and Cancer Hospital, where the eruption has been almost universal; in these there were large patches and gyrate lines covering most of the body and limbs. When extensive and fully developed the crusting in these instances may not be very suggestive of favus, as they are more often of a dirty brown color, and, being aggregated in masses, the distinct cup shape is often lost.

Favus of the Nails.

This is occasionally seen, both in those who have the disease elsewhere and those who care for the treatment of these patients; but it is very rare compared to the real frequency of the disease. The condition produced in the nail is almost exactly like that caused by the trichophyton parasite, as already described, and a differential diagnosis can hardly be made except by the aid of the microscope or on etiological grounds. Kaposi states that the fungus causes yellow or yellowish-white points in the nail, corresponding to the "cups" on the scalp; but the writer has never noted such in the cases under his observation.

Etiology.— The fungus of favus, as seen by experimental inoculation, is slow in generation and requires both a suitable soil and proper protection for its full development. Hence, although the disease is communicable it is not by any means so contagious as is ringworm, although it will not infrequently be found in several members of a family. Duhring mentions an instance in London where thirteen members of one family were infected in the course of years.

The infection is derived not only from other cases, but also from animals; the disease is not very infrequent and takes a very severe form on mice, even penetrating the skull, and cats, dogs, and rabbits also contract it, and children from them. The eruption begins most commonly in childhood, and is more common in males than in females. Of the one hundred and three cases alluded to in the New York Skin and Cancer Hospital sixty-eight were males and thirty-five females, nearly two to one. Favus is largely a disease of the poorer classes, where cleanliness is neglected.

Pathology.—The crusts which constitute the main objective feature

of the eruption are composed almost entirely of the exuberant growth of the parasite, *achorion Schönleinii*, which was discovered by Schönlein in 1839. The mass when cut across is found to be soft and porous, and crumbles quite easily between the fingers.

When ground up with a little liquor potassæ and glycerin, and examined microscopically with a medium power (300 to 500 diameters), the field is full of oval bodies and short-jointed tubes (Fig. 48) some of them branched but none of them very long, the spores or *conidia* and *mycelium* of the parasite. Both are much larger than those of the trichophyton, indeed they are the largest of any of the

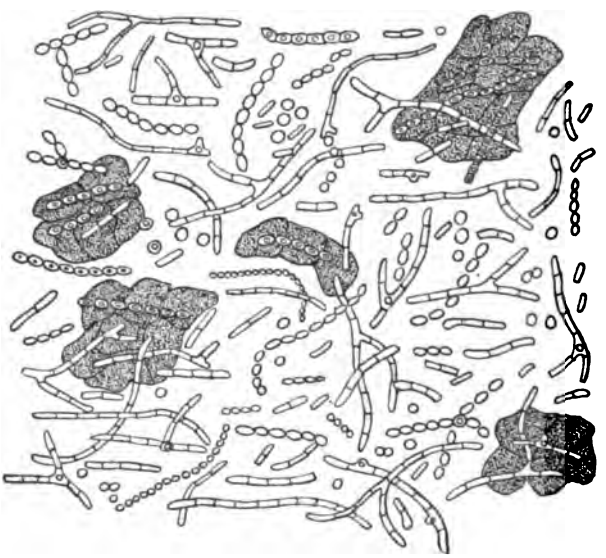

Fig. 48.—Spores and Mycelium from Crust of Tinea Favosa.

vegetable parasites; the markedly oval shape of most of the spores is also very characteristic. A crust from epidermic favus will present the same features. A section of the nail affected with favus will appear much like that attacked by trichophytic disease (Fig. 45), but the spores are larger and oval, and the mycelial joints shorter. When the fungus has more opportunity of free growth, as in the scales around the "cup," the mycelium will develop longer branches, and when cultivated in various nutritive substances it presents many variations.

In the hair follicle and hair the achorion acts much as does the trichophyton, penetrating them mainly with a series of short-jointed mycelium, in the latter running parallel to the axis, but luxuriating freely in every direction in the root sheaths (Fig. 49).

The fungus of favus gains access, as in the case of the trichophy-

ton, between the epithelial cells, mainly at the opening of the hair follicles, whether on the head or on the body. It is probably inoculated on the epidermis in other parts of the body by slight scratches.

A number of observers have been studying the fungus found in

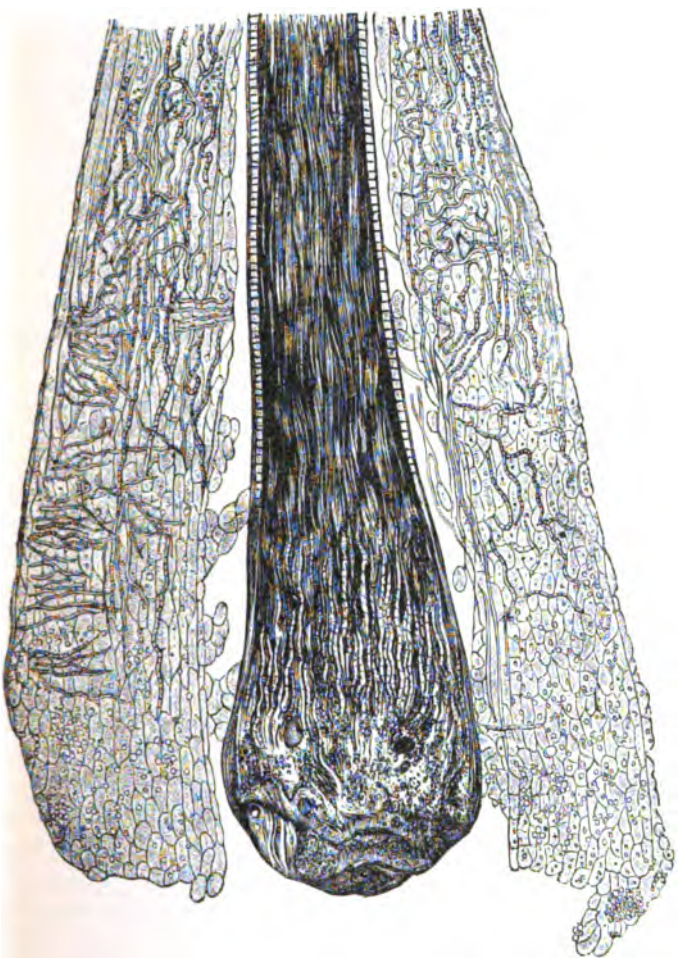

FIG. 49.—Hair-Bulb and Root-Sheaths infiltrated with Achorion Schonleinii from Favus. (After Kaposi.)

favus, and it has been thought by Quincke, Unna, and others that there are several (three) distinct forms to be discovered. But others fail to identify the differences, and several are positive that there is but one fungus; the matter, therefore, requires much further study before anything positive can be accepted. Practically the fungus

already described is such as is ordinarily met with; its recognition is not difficult, and requires little or no technical skill.

Diagnosis.—When the sulphur-yellow, cup-shaped crusts, or scutula, penetrated with a hair or two, as has been described, are found, the diagnosis is absolute, as these occur in no other skin affection. But in certain stages of the disease, where the crusts have massed together, or when the disease has been under treatment and the crusts have been removed, the diagnosis may be somewhat difficult. But the careful use of the microscope on the crusts, scales, or removed hairs will place the nature of the disease beyond doubt.

In different phases, stages, or conditions favus of the scalp may possibly be confounded with a number of eruptions: *psoriasis, eczema, seborrhœa, tinea tonsurans,* and *syphilis,* and the scars with those formed by *lupus erythematosus,* etc.; while epidermic favus may in certain cases suggest *tinea circinata, impetigenous eczema, crusted syphilide,* and even *epithelioma.* The eruption of favus is so distinctive, the points of resemblance to any of these are so few, and the microscope affords such positive assistance that it is hardly necessary to dwell further on the subject.

Treatment.—The treatment of favus differs according to its location; we will first briefly dismiss that of the disease when it affects epidermis and nails.

The hold of the fungus on the free surface is very slight, and where there are only isolated points these may easily be picked out with the point of a knife, and a little mild mercurial or sulphur ointment, as recommended under trichophytic disease, well rubbed in, will generally end the trouble in a short time.

When there is a considerable area of the body affected the crusts will require to be softened by soaking with oil, when they can be easily removed by means of a warm bath and soap. The surface then is treated, as in the case of body ringworm, with mild parasiticides. But where there are coarser hairs, the parasite may have penetrated the follicles more or less deeply, and so the disease be reproduced, unless the treatment is kept up for some little time, even for several weeks.

Favus of the nails is to be treated by the methods recommended under trichophytic disease in this locality. It will be found very stubborn, and treatment must not be discontinued until the nail has quite regained its normal appearance, for any fungus left in the nail will be sure to reproduce the affection.

Favus of the scalp will often tax the patience and skill of the physician greatly, and many remedies may be tried before the disease is completely eradicated. The treatment is to be conducted on the

principles laid down under ringworm of the scalp and beard; namely, the extraction of the hairs and the continuous application of substances destructive to the life of the parasite. There is this difference, however, that epilation forms a much greater element in favus than in ringworm, and, fortunately, owing to the lesser disintegration of the hairs in the former, this can be more efficiently practised.

The crusts are first to be removed by thoroughly soaking the scalp again and again with carbolized oil (gr. x. to ʒ i.), and then working them off with the forceps or a dull instrument. The scalp is then thoroughly washed with hot water and a carbolized or tar soap, or with tincture of green soap with bichloride (℞ Hydrarg. bichloridi, gr. v.; saponis viridis, ʒ ij.; spts. vini rectif., ♏ i. M.). This latter is poured on the scalp and hot water is added slowly with friction until a full lather is formed, which is then well rinsed off. A mild parasiticide should then be well rubbed in over all the affected portions, and moderately upon the whole scalp.

Epilation should be commenced at once and practised daily, or twice a day if possible, until all the affected areas are completely devoid of hair, a strong parasiticide being very thoroughly rubbed in immediately after each epilation. About the best application for this purpose is bichloride of mercury in solution (℞ Hydrarg. bichloridi, gr. v.-xv.; ammon. mur., ʒ ij.; aquæ, ʒ iv. M.). The areas treated should be wiped free from ointment before epilation, and the lotion should be well rubbed in with a swab on the end of a stick or with a soft tooth brush; it will smart very considerably at first. It is sometimes well, before epilation, to rub the surface over with carbolic acid, fifty per cent. or stronger, to deaden the sensibility as well as to aid in destroying the fungus.

Where the areas to be epilated are not very extensive, the hairs may be removed by broad-edged epilating forceps (Fig. 43). A larger number may be removed at once by means of a dull table knife held in the hand and the hairs seized between its blade and the thumb; for this procedure it is necessary to have the hair half an inch or so in length.

If the affected surface is very large and pretty thoroughly diseased, a more wholesale removal of the hairs may be effected by means of the epilating sticks, devised and used extensively by the present writer some years since. The formula is as follows:

℞ Ceræ flavæ, ...	ʒ iij.	11.66
Laccæ in tabulis, ...	ʒ iv.	15.55
Resinæ, ...	ʒ vi.	23.32
Picis burgundicæ, ...	ʒ x.	38.87
Gummi dammar, ...	℥ iss.	46.65

M.

After the ingredients are thoroughly incorporated, the mass is rolled into sticks of various sizes, from one-quarter to three-quarters of an inch in diameter, and cut off in lengths of two or three inches each. The idea of the different sizes is that the work may be rapidly done with the broader sticks, where a large surface is to be gone over, while the thinner ones fit small irregularities, or can be applied to isolated spots. These sticks are quite hard and firm at ordinary temperature, but melt easily and cool quickly.

The sticks are applied by slightly melting the end in a spirit lamp, and care must be taken not to place them upon the part instantly, but to allow them to cool again somewhat before applying. The hair should be cropped short, about an eighth of an inch in length, over the part to be treated, and as the stick is applied a slight rotary or twisting motion is given to it in order to work the short hairs into its surface. It is to be left on several minutes, and is removed by bending it over and drawing the hairs in succession with a slight twisting motion. When the stick is removed from a greatly diseased patch which has still much hair, the end is thickly set with bristling hairs, resembling a fine brush. This is then burned off in the flame, the melted end wiped firmly on a sheet of paper, and with a little fresh melting it is reapplied to a new place. In this manner a very large area can be completely epilated in a very short time, and, by using a dozen or so sticks, several can be hardening in position while others are removed, burned, and replaced. The pain attending the extraction of the hairs by this method is not nearly so great as might be imagined, although it is considerable, and the writer has used it repeatedly on the same case without an anæsthetic; the pain is diminished by the previous application of carbolic acid, also by the free and thorough application of a ten-per-cent. ointment of cocaine in lanolin and vaseline. Some care must be exercised not to cause the stick to adhere over a place where there is healthy hair, for such wholesale extraction is extremely painful, indeed almost impossible.

In the treatment of favus of the scalp it is not sufficient to epilate the surface once, for some of the fungus is left in the follicle and may re-grow; the process should be repeated as long as any of the hairs show any signs of the parasite. The number of hairs ultimately extracted even from a relatively small patch may be very great. In one case in the writer's private practice there were in all about seventy-eight thousand hairs removed over an irregular area of disease measuring about two square inches; on one occasion there were twenty-six hundred hairs removed at one sitting.

In the later treatment of very chronic cases strong parasiticides will often be needed, but their apparent failure will often be very try-

ing. The oleate of mercury (ten to twenty per cent.) is valuable, as also the mixture of equal parts of the iodine and mercury ointments of the Pharmacopœia, likewise the nitrate of mercury ointment diluted three or four times; care must be taken against salivation. Chrysarobin in vaseline (gr. xv.–xxx. ad ʒ i.) is often efficacious. Crocker recommends resorcin, one drachm to the ounce of lanolin and oil.

Watery and alcoholic solutions are of some value. The bichloride of mercury has already been mentioned, and should always be employed more or less in these cases. Strong solutions of hyposulphite of soda, also very fresh sulphurous acid (as spoken of under eczema marginatum) are valuable; absorbent cotton, in very thin layer, is wet with one of these and laid closely over the affected area, and covered lightly with gutta-percha tissue.

In treating favus of the scalp great care must be exercised in regard to pronouncing the case cured, for it is most treacherous. It is not very difficult to remove most of the visible traces of the disease, so that the patient seems well when there is yet abundance of the parasites lurking in the follicles. The true progress can only be told by the microscopic examination of the hairs. When the treatment has progressed well, and before the case is dismissed, it may be left several weeks without any treatment whatever, and if there is still disease it will be manifested by the formation of fresh cups, when it should be again vigorously attacked. Sometimes the ordinary care of the head will prevent them from forming, and there will be only a scaly condition, which may yet contain the fungus and develop the disease afresh. Cases can be declared as absolutely cured only after they have remained without any treatment for some months, and are still free from all signs of the disease microscopically or otherwise.

Prognosis.—Epidermic favus, unless very extensive, should yield completely in a short time, days rather than weeks. But favus of the scalp is extremely rebellious although surely curable by patient and intelligent treatment, however long it may have existed. But the treatment even if very active may last for many months, and if indifferently carried out it may extend over years. It is possible for recent favus of the scalp to get well under very active and proper treatment without any resulting baldness and cicatrization, but in the large majority of cases there is more or less destruction of the follicles and permanent baldness; this seems to be largely in proportion to the duration of the disease. The early extraction of the hairs and treatment render the prognosis in this respect more favorable.

V. Erythrasma.

This is one of the most superficial and slightest of the parasitic affections. It seldom gives much annoyance and frequently passes long unnoticed by those who have it; indeed, it is not infrequently first discovered by the physician when examining the patient for some other trouble.

It is characterized by brownish-red or at times yellowish patches of various sizes, chiefly limited to regions where two surfaces come in contact, and is most commonly found in the groins or sides of the thighs. The patches increase peripherally, as do the other vegetable parasitic diseases, and may be observed of various sizes, though often the disease will cover quite an area uniformly. The earlier patches are of a more red color, the oldest may be of quite a dark brown. The eruption appears to be level with the skin, but the edges are well defined and can sometimes be detected by a delicate touch; the surface may present a slight desquamation, most marked at the edge; but this is very slight when compared even with that of tinea versicolor. It is a disease of middle life, rarely affecting the very young or aged. The eruption gives little or no sensation and may slowly increase for years without causing much if any discomfort.

Pathology.—Most writers now agree that this eruption is distinct from either eczema marginatum or tinea versicolor (which is not very uncommon in this region) and which may at times resemble it. The parasite which was named *microsporon minutissimum* by Baerensprung is extremely minute and often requires the examination of many specimens, and at a high power of the microscope for its discovery. As generally described it consists of very fine, pale, interlacing threads, which are jointed, the segments being rather short and of variable thickness (Fig. 50). These may be interwoven into masses, but they do not ordinarily branch as do other vegetable parasites.

FIG. 50.—Fungus from Erythrasma. (After Leloir-Vidal.)

The exact character of the parasite is as yet undecided, and has been the subject of much recent research. Some have claimed that the mycelial growths just described, which have been identified as a

leptothrix epidermidis, common on the skin, is not the cause of the eruption, but that it is due to the spore-like bodies from which the parasite originally took its name. P. de Michiele succeeded in producing the eruption by inoculations with pure cultures of the microsporon, but failed with those from the leptothrix.

Diagnosis.—The eruption is to be distinguished from *tinea versicolor, eczema marginatum*, and *chloasma*. Its absence from regions of the trunk usually affected with *tinea versicolor*, and its limitation to moist, warm places, as well as its darker color, should distinguish it from that affection. In cases of doubt microscopical examination of the scales will quickly decide the matter, for the parasites of the two differ materially, that of tinea versicolor being very abundant and very much larger in its elements than that of erythrasma. The absence of inflammatory symptoms and great itching would distinguish it from *eczema marginatum*, and the discovery of the trichophyton fungus by the microscope would establish that disease. *Chloasma* is a purely pigmentary affection, involving almost exclusively the face, and without any scaling.

Treatment.—The therapeutic measures recommended for tinea versicolor will be found effectual in erythrasma.

VI. Myringomycosis.

Synonyms.—Mycomyringitis; otomycosis; otitis externa parasitica; fungous disease of the external ear.

Fungi have long been known to exist in the external auditory canal, certainly since the observation of Mayer in 1844, but special attention was called to the disease by Wreden in 1867, since which time very considerable literature on the subject has developed. There is still much confusion as to the actual conditions belonging to this affection, but Burnett and more recently Barclay have made careful studies of the matter, and to them most of our real knowledge of the condition is due. The frequency of cases of the disease varies in otological practice, according to different reporters, from 1 to 0.1 per cent. It is occasionally met with in dermatological practice, patients seeking relief on account of the annoying itching deep in the ear.

The disease is described as primarily affecting the drum, which it may attack very severely, even causing perforation. Later it extends to the canal until the entire meatus is involved; or, after a time, the parasitic growth may be limited to a circumscribed portion of the wall of the canal. There is at first "stinging, itching, dulness of hearing, some pain and a watery but scant discharge. The patient may finally complain of great pain and deafness, if the mem-

brana tympani should become inflamed." When fully developed the inner end, or sometimes the whole of the wall of the canal and the drumhead, is covered with a substance resembling wet newspaper or dirty blotting-paper, with small raised spots of a black, brown, green, or yellow color. This is often glazed by the serous effusion passing over it, which is sometimes so profuse as to fill the canal. If forcibly removed the underlying surface is more or less raw and may bleed. There is always considerable itching, causing the patients to attempt to scratch or rub the canal deeply.

Etiology.—The disease is caused by the development in the canal of a vegetable growth, but writers are not yet agreed as to the conditions which induce it. It is most common among rural inhabitants, especially in those who live in damp or dark apartments; it is rarely found in the very young or the aged. By some it is believed to be the result of previous disease of the meatus, and that the fungus is only saprophytic; but as the affection is relieved by antiparasitic treatment, it is believed by many that the vegetable parasite is the active cause of the trouble.

Pathology.—Great divergence of testimony exists as to the exact fungus present, and Barclay has collected statements in regard to no less than thirty-four varieties of fungi which have been reported by different observers in this connection. But most writers agree that the disease is commonly due to the growth of the *Aspergillus niger* and *Aspergillus glaucus*, the former causing the more severe symptoms. Under the microscope these show tube-like structures, and some of those growing from the free surface will exhibit expanded sporangeia, perhaps already ruptured, giving exit to spores.

Treatment.—This consists in applying agents to arrest and destroy the growth of the parasite and to check the existing inflammation and irritation. The ear should be first syringed with a mild borax solution, which will remove a portion of the fungus. Burnett and Barclay recommend most highly the use of a powder freely blown into the cavity (℞ Chinoline salicylate gr. xxx., boric acid ʒ ss.–i. M.). Salicylic acid two per cent. in diluted alcohol is also highly recommended, as also permanganate of potash in a one- or two-per-cent. solution in water. Other mild parasiticides will also answer, but it is stated that fatty matter and also tannin rather favor the growth of the parasite. If the seat of the disease seems to be deep, especially if it has penetrated the tympanum and involved the middle ear, its treatment belongs rather to the province of the otologist.

Prognosis.—This is generally good, and the disease should yield quickly to properly directed treatment, but tends to relapse. If it be neglected or badly treated, deafness may result.

VII. Vaginomycosis.

Synonym.—Parasitic disease of vagina and labia.

A considerable number of writers have from time to time reported the finding of vegetable organisms in the vagina and on the labia in connection with pruritic irritation of these parts, but as yet it has not been definitely determined as to which forms of the fungi have been pathogenetic and which have been harmless. Salisbury described and figured what he called *Penicillium pruriosum*, and also *Torula utero-catarrhalis*, found in cases of severe pruritus of the vulva. Haussmann has made a careful study of the subject and instituted a number of inoculation experiments, which satisfied him that certain forms of vegetable growth were capable of producing such an irritation. In cases which he had inoculated there occurred in nine or ten days a violent itching and burning, with intense reddening of the mucous membrane from the labia minora to the uterus, with subsequent catarrhal discharge.

Clinically cases are constantly met with where there is a deep irritation of the parts, with no external manifestations of disease. There will be no signs of eczema present, and the cases are commonly classed only as pruritus. Further investigations are needed, for it is more than probable that there are morbid conditions of these parts thus caused, and possibly several forms may be differentiated due to different parasitic growths. The irritation of the vulva accompanying glycosuria is well known, and is undoubtedly due to the vegetable growth encouraged by the saccharine matter present. The irritation of the mucous membrane of this region due to the gonococcus is also well known.

Etiology.—About the only element known is that an acid state of the secretions is necessary to the growth of these vegetable parasites; they were not found when the secretion was neutral or alkaline. This corresponds with the clinical observation of the benefits accruing to patients with vaginal irritation from the free use of alkaline injections.

Pathology.—While not infrequently the large and coarse filaments of the oidium (or saccharomyces) albicans and oidium lactis and other fungi are found in connection with discharges from the vagina, Haussmann believes that irritation of the parts is commonly caused by the *leptothrix vaginalis*. This is a more delicate organism and appears as fine threads of uniform calibre, which may readily be seen interlacing over and among the large flat cells from the vagina.

Treatment.—The treatment most recommended is sulphate of copper in one- to two-per-cent. solution in hot water, freely injected twice daily. A solution of carbolic acid and borax used twice daily also serves excellently well. Hyposulphite of soda is likewise valuable.

VIII. Labiomycosis.

Synonyms.—Thrush; Fr., *Muguet;* Ger., *Soor;* also, Fr., *La perlèche;* parasitic disease of the lips.

As the other orifices of the body, where the skin is transformed into mucous membrane, may be the seat of parasitic infection, so the lips may become similarly affected; an instance of this is found in thrush, caused by the presence of the *Saccharomyces albicans*, which need not detain us here. As yet, however, but little is known of this condition except as affected by thrush.

Lemaistre has recently described another parasitic disease of the lips which he observed in Limoges, where he found it in three hundred and twelve children among fifty-five hundred examined. The lips smart, become dry and crack, and become readily excoriated. The name *la perlèche* is given to it because the children so affected lick the lips to relieve the irritation, and so cause a macerated and exfoliated state of the epithelium, which may at times resemble mucous patches; the lips may also crack at the corners.

The author places the parasite (a microbe) in the class of schizomycetes with the name of streptococcus plicatilis. These were found on the edges of the epithelial cells of those affected; he succeeded in cultivating them. The organism lives in stagnant water and he believes it thrives when brought into the warm atmosphere of the house, and readily infects children from drinking-vessels.

The affection, if it be further established to be such, belongs rather to the next group of diseases, those caused by micro-organisms of uncertain nature, but is mentioned here as directing attention to a disease of the lips which may hereafter receive more study.

IX. Pinta Disease.

Synonyms.—Spotted sickness; Sp., *mal de los pintos; carate* or *cute; quirica.*

This eruption is confined chiefly to the tropical regions of South America, and it is not known if any cases have as yet been identified in this country, though from our frequent intercourse with the localities where it occurs, it is liable to appear among us. Crocker has given an excellent résumé of the reports concerning it, which we will epitomize.

The disease usually begins on uncovered parts, such as the face and extremities, but may affect the scalp and all parts of the body except the palms and soles. It consists of scaly spots, very variable in number, shape, size, and color, which are not at all, or

very slightly, raised above the surface. Their color varies greatly, from black, through grayish and blue, to red or dull white, which may sometimes all be present in the same individual. The patch is furfuraceous at first, chiefly in the black and blue, forms, but the scales are larger in advanced cases, and the surface usually feels rough and dry. In the red forms ulceration sometimes occurs. In hairy parts the hairs get thin, turn white, and ultimately fall out. Some of the blue cases look as if tattooed with gunpowder, while the white patches have a cicatricial aspect with a dark ring, and the skin is hard with diminished sensation. The itching is in proportion to the scaling, and may be intense. The disease is very chronic. New patches form continually and coalesce with others.

Etiology.—The disease is recognized as undoubtedly contagious, and is favored by dirt and neglect, being more common among the poor; it attacks both sexes and all ages, but spares infants. Though it sometimes commences in a sound skin, a dermatitis such as eczema favors its development.

Pathology.—A fungous growth has been demonstrated consisting of rounded or oval spores about 8 μ in diameter, and tapering branched mycelial threads to which the conidia are attached. It is thought that in the black and blue spots the fungus extends only to the horny layers, but in the red and white variety the corium also is affected, leaving permanent scars.

Diagnosis.—Too little is known of the disease to draw any differential points. It is said to be readily recognized in countries where it is endemic.

Treatment.—This is the same as for tinea versicolor, but it is said that recurrence may happen from spores which have escaped detection.

X. Actinomycosis of the Skin.

This disease, which was first described by Bollinger in 1877 as occurring in the jaws of cattle, was observed in man the same year by Israel; in 1879 Ponfick recognized its true nature and identified it as the same disease which appeared in cattle. Since that time numerous studies of the parasite have been made and many cases have been reported, in this and other countries, of its occurrence in internal organs and on the skin, and it seems probable that as it becomes better known it will be found that the disease is not so rare as has been supposed. Recent studies by Kanthack, Hewlett, and others have shown that this disease is probably the same as the fungous foot of India, next to be described, the parasite in the two being closely related, if not identical.

Very little is known as to the earliest manifestations of the disease in the skin; thus far most cases have been recognized only after the tumors have opened and given exit to the discharge, from which the diagnosis has been made. In earlier stages tumors are noticed of a livid color, principally about the sides of the face and lower jaw, but also on many other portions of the body, which have generally been thought to be sarcomatous or tuberculous. The skin will finally become darkened over one or more points and rupture, giving exit to a discharge which may be thick at first and afterwards thin and sanious, containing small sulphur-yellow particles which are composed of masses of the parasite. Fistulous tracts are thus made, leading down to the original tumor, from which the discharge continues. The disease is exceedingly chronic and insidious in its beginning, and nothing is known in regard to the length of time which elapses from the entrance of the parasite to its external manifestations on the skin.

Etiology.—The disease has been principally found in young adults, and more frequently in men than in women; it is also most common in those who have to do with cattle and horses or with their feed. The exact method of the entrance of the parasite has never been clearly established, but it is supposed to enter through the respiratory passages. From the number of cases in which there have been carious teeth and lesions of the mouth, it is believed that it there gains entry. It is suggested that the fungus is found on straws and may be acquired by sucking through or picking the teeth with them. The disease has not followed the administration of the fungus to healthy animals by the mouth, but has resulted from inoculations with it beneath the skin or into the peritoneal cavity.

Pathology:—The tumors which form resemble sarcoma in their minute structure, being made up chiefly of round cells with numerous fusiform connective-tissue cells, and are highly vascularized.

The parasite, *actinomyces*, or ray fungus, is found in the seropurulent fluid as small, opaque, yellowish-white grains quite visible to the naked eye. Under the microscope they are seen to consist of closely woven threads more or less radiating from the centre, the ends being club-shaped.

Diagnosis.—This may be extremely difficult until the disease has fully declared itself and opportunity is given for careful microscopic examination of the contents of the tumor. In its earliest recognizable condition it is suggestive of a *syphilitic gumma, adenoma, sarcoma*, or *carcinoma*, and later of *scrofuloderma*.

Treatment.—This is local and surgical, and relates to destroying the localized foci of disease. In some cases excision may be required, but cases are reported of cure by less severe means. The

sinuses should be laid open and thoroughly curetted and the resulting wounds treated with antiseptics, mercury, or iodine.

Prognosis.—The prognosis must vary greatly with the case and the progress of the malady. Where the affected parts can be reached and removed perfectly, recovery will result. But the disease may result fatally, as it does when internal organs are attacked.

XI. Mycetoma.

Synonyms.—Podelcoma; Madura foot; fungous foot of India.

This rare affection was long supposed to be indigenous to India, but more recent observations have shown that it occurs in other countries as well; cases have been reported in Mexico, in the United States by Kemper and Hyde, and in Canada by Adami. Its most common site is the foot or the hand, but it has been observed elsewhere on the body. Men are more frequently attacked than women.

The disease may begin very insidiously with a single papule or pustule, frequently on the sole of the foot, but it may come on a toe or a finger. This enlarges and finally breaks down, giving exit to small yellow or black round bodies resembling seeds. The neighboring skin shows another pustule, and in this manner there may be a number of pustular openings near one another, somewhat resembling a sluggish carbuncle. The process gradually extends by the formation of new foci of disease until the entire member may be involved and rendered useless. The disease is very slow in its progress.

In the fully developed disease numerous openings surrounded by raised margins, or perforating the summit of elevated tuberculations, are present on both the upper and under surfaces of the hand or foot. These communicate with channels lined with smooth membranous tissue and leading into the substance of the part. On making a section through the affected member the bones are found to be softened and opened out in texture, being at times spongy and friable, or the bone texture may be replaced by soft gray pulp, being indistinguishable from the surrounding degenerated tissues.

Etiology.—This is very obscure. The disease is most common in those who go barefoot, and it is thought that the parasite gains entrance through superficial wounds.

Pathology.—As already mentioned, all the tissues of the foot become affected by the parasite, forming a disintegrated mass with many sinuses leading to cavities within. Both the cavities and channels are lined with a fibrous membrane and contain granules of a yellow, brown, or black color, which occur separately, or are aggregated into mulberry-like masses.

Vandyke Carter, who first described the disease some thirty years ago, recognized that these black or yellow particles were a fungus, which was named after him *chionyphe Carteri.* There have been considerable study and discussion in regard to the nature of the fungus and the relations between the yellow and black particles, which need not occupy us here. Kanthack and others have demonstrated pretty clearly, however, that the parasite is none other than the ray fungus belonging to actinomycosis of the skin already described.

Diagnosis.—In the beginning an absolute diagnosis is almost impossible, but when one or more sinuses are formed with a pouting mouth, giving exit to black or yellow masses, resembling fish-roe, the diagnosis can be established with the microscope.

Treatment.—In the early stage thorough curetting and cauterization may check the trouble, but when it is fully developed nothing short of free amputation beyond the affected area can be of any service.

Prognosis.—The disease does not tend to extend much beyond the member affected, and, as far as is known, does not result fatally in itself. But on the other hand spontaneous recovery is unknown, and the affected portion will always remain useless and distressing, and the disease will be little if at all controlled by other than surgical treatment.

XII. Alopecia Areata (some forms).

Synonyms.—Tinea decalvans; porrigo decalvans.

Alopecia areata, as generally understood, has not been regarded as a parasitic disease of late years, but observations are multiplying which show that a certain proportion of cases which would be recognized as such (which Crocker believes to be very large) are due to a vegetable parasite. The matter has already been referred to under *Bald Tinea Tonsurans* (page 75), and in the next section the disease also appears as associated with microbic life. As alopecia areata will be considered in full elsewhere in this volume it need not be further entered upon here.

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C. MICROPARASITIC DISEASES.

The rôle played by the lower micro-organisms in the production of disease of the skin has been the subject of much study for the past decade, and the literature relating to the subject is very great. In earlier years the discovery of these bodies in connection with a skin lesion was too often claimed to point to an etiological relationship, and naturally great distrust arose in the minds of many as to the correctness of the supposition. But with the advances in bacteriology, including many improved and more or less perfect methods of recognizing and isolating various micro-organisms, of making pure cultures from them, and then of inoculating the same, some light has begun to dawn on the subject of their relationship to diseases in general and also to those upon the skin.

It is not necessary to enter upon this subject at all fully in the present place, nor even to discuss the principles upon which judgment should be formed as to the etiological relation of micro-organisms to disease of the skin. It must be accepted that certain forms of microbic life have been proved conclusively to be capable of reproducing the disease from which they were taken, both in the case of certain general diseases and also in some affections coming under the province of dermatology. The instances given in the preceding section of the power of the grosser parasites to induce lesions of the skin would naturally lead us to believe that others, yet lower in the animal or vegetable kingdom, are capable of the same. But, on the other

hand, much careful study and laboratory experimentation, as well as physiological and pathological investigation have developed the fact that the numbers and varieties of micro-organisms are immense, and that they exist almost universally on every side. They have also demonstrated the fact that perhaps the greater portion of them are perfectly harmless and have as their function only to carry on the beneficent process of nature, while relatively few have been demonstrated to be capable of exciting disease in healthy living tissues. Hence the division has been made into *pathogenetic* and *non-pathogenetic* micro-organisms. And many which have been at one time or another found in connection with disease and have been supposed to be pathogenetic, have been shown to be harmless and to exist where no disease was present.

This has further developed the study of the circumstances and conditions of their existence and the soil on which they have taken root. As in the case of the fungi it was found that all individuals were not equally susceptible to their pathogenetic influence, so it is supposed that even those micro-organisms which are capable of producing disease cannot act thus except under favorable conditions of the system; this is notably the case in regard to the bacillus of tuberculosis which is so widely present.

It is impossible at the present time to speak with certainty in regard to the pathogenetic or non-pathogenetic microbes of the skin, or to the conditions favorable to their development; but with the light which is being thrown on these subjects almost daily it is believed that the near future will present developments which will be of real value.

At the present time it seems desirable only to call attention to the large number of affections of the skin in which more or less definite studies have been made in regard to the influence of micro-organisms in their production. We have, therefore, prepared a table exhibiting the same, as far as was possible, and have attempted to classify the diseases somewhat according to the findings of different observers. As these diseases are treated of in other portions of this work, no attempt will be made to speak in detail of them or of the influence of the micro-organisms in their production. The table is to be regarded rather as suggestive than as authoritative.

In separating those in which micro-organisms are more or less accepted to be the cause of the lesions from others where the connection is stated as not definitely proven, the effort has been to present the weight of authority of more than one observer, and it is quite possible that further study and observation may and probably will alter the relative positions of many of the diseases. The writer

would further state that in thus apparently accepting the microbic origin of many of these affections he only presents the observations of those who have worked on the subject, without committing himself as to the accuracy of the statements or accepting unreservedly the pathogenetic action of the micro-organisms, apart from constitutional conditions and relations.

The following table represents the position of the microbic origin of diseases of the skin, as claimed by many different observers and as more or less accepted at the present time:

DISEASES OF MICROBIC ORIGIN.

Cocci believed to be the cause.	Acne (see also bacilli).	Staphylococci.
	Delhi boil.	
	Dermatitis papillaris capillitii.	
	Diffuse phlegmon.	
	Ecthyma.	
	Furuncle.	
	Hydroadenitis.	
	Impetigo.	
	Impetigo contagiosa.	
	Panaritium.	
	Perifolliculitis suppurativa conglomerata.	
	Sycosis coccogenica.	
	Erysipelas.	Streptococci.
	Impetigo contagiosa streptogenes (Unna).	
	Carbuncle.	Staphylo- and streptococci.
Bacilli believed to be the cause.	Anthrax (malignant pustule).	
	Glanders.	
	Lepra.	
	Lupus.	
	Tuberculosis cutis.	
Cocci not definitely proven to be the cause.	Impetigo herpetiformis.	Staphylococci.
	Pemphigus acutus.	
	Phagedæna tropica.	
	Vaccinia.	
	Variola.	
	Frambœsia.	Streptococci.
	Mycosis fungoides (see also bacilli).	
	Phlyctænosis streptogenes (Unna).	
	Acne varioliformis.	Staphylo- and streptococci.
	Erythema multiforme.	
	Alopecia areata (see also bacilli).	Micrococci.
	Epidemic dermatitis (Savill).	
	Hyperkeratosis subungualis (Unna).	
	Noma (see also bacilli).	
	Eczema seborrhœicum (see also bacilli).	Morococci (Unna) (mulberry-cocci).
	Pemphigoid exanthem (Unna).	
	Pityriasis rosea.	
	Psoriasis.	

DISEASES OF MICROBIC ORIGIN—*Continued.*

Bacilli not definitely proven to be the cause.	Acne (see also staphylococci). Alopecia areata (see also micrococci). Chancroids. Cheiropompholyx. Eczema seborrhœicum (see also morococci). Erythema nodosum. Lichen ruber. Lichen scrofulosorum. Measles. Miliaria rubra et alba. Mycosis fungoides (see also streptococci). Noma (see also micrococci). Pemphigus vegetans. Purpura hæmorrhagica. Rhinoscleroma. Scarlatina. Sycosis bacillogenica (see staphylococci). Syphilis. Trichorrhexis nodosa.
Protozoa.	Carcinoma. Herpes zoster. Keratosis follicularis contagiosa (Brooke). Molluscum contagiosum. Paget's disease. Psorospermosis follicularis vegetans (Darier).

It has been difficult to do full justice to the many findings which have appeared from time to time, and it is quite possible that some have been omitted which have seemed more or less definite and positive. The micro-organisms which have been observed in connection with bromidrosis and chromidrosis, also in certain disorders of the hair, leptothrix, tinea nodosa, and piedra, have not been included as somewhat uncertain of classification. It will be noticed that some diseases appear more than once in this list; further study can alone determine which if either of the micro-organisms is pathogenetic in them.

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ERYTHEMATOUS AFFECTIONS.

BY

HENRY H. WHITEHOUSE,

NEW YORK.

ERYTHEMATOUS AFFECTIONS.

THE various diseases comprising this class belong to the general group of hyperæmias or congestions. Inasmuch as congestion is an early stage of all inflammations, it is obvious that this arrangement can be, at the best, only a conventional one. Diseases will appear here, therefore, in which hyperæmia is the most important and prominent feature, but which in certain cases, if speedy relief is not obtained, may present most advanced inflammatory phenomena.

Hyperæmia may be active or passive. In *active* hyperæmia there is a rapid and increased flow of blood through the capillaries. This may be produced by the effect of various forms of local irritation upon the skin or by reflections from the central nervous system from toxic or other causes, resulting in a disturbance of the vasomotor nerves. In consequence, the affected area presents a vivid red color and the local temperature is increased.

Passive hyperæmia, on the contrary, is an engorgement or overdistention of the vessels—in other words, a stasis. This may be produced by local pressure—a condition well illustrated by encircling a limb with a tight band, or by changes in the vessel walls or surrounding tissues resulting in relaxation. The color in this case is a livid red or blue, and the local temperature is decreased. As further stages in this process we have asphyxia, suppuration, gangrene, etc.

ERYTHEMA.

This term, representing a type of active hyperæmia, simply means redness, though it has been employed indiscriminately to designate various diseases, which in reality are only different stages in the same disease process. It is applied alike, for example, to diseases due to simple hyperæmia, such as erythema simplex, and to exudative and inflammatory affections, such as erythema exudativum. This confusion has been enhanced by the endeavor to group the cutaneous phenomena of some of the acute infectious diseases with erythema. There is absolutely no scientific basis, however, for separating these from the diseases of which they are merely symptoms. Erythema is,

therefore, only a symptom, like pruritus or dropsy, and should never be used without a qualifying adjective. It may be defined as *a local congestion accompanied with superficial redness which disappears under slight pressure.*

Although no pathological line can be drawn between hyperæmia and inflammation—the one following so closely upon the other—it is found convenient clinically to divide erythema into two groups: (1) Hyperæmic erythema, or Erythema simplex; and (2) Inflammatory erythema.

(1) HYPERÆMIC ERYTHEMA, OR ERYTHEMA SIMPLEX.

This group is characterized, in general, by localized patches of redness, of various sizes, which are well-defined and arranged in a discrete manner, or are more diffuse in outline, merging imperceptibly into the healthy skin. In addition, there may be rings of erythema and irregular-gyrate patterns, or a more diffuse redness more or less general in extent. These are all unaccompanied by swelling. The color ranges from a bright red or scarlet, when the hyperæmia is due to arterial congestion, to a livid red, blue, or purple hue, when passive, venous congestion predominates. All shades of red, rose, and pink are observed in intermediate stages. The lesions impart a sense of heat to the touch and the patient complains of burning, tingling, or itching, and not infrequently there is slight tenderness; rarely, however, is there any constitutional disturbance. The redness may be only transitory, or may remain for a longer time, fading gradually, and sometimes slight desquamation follows it. Pigmentation may or may not result, depending upon the stage at which the process is arrested.

Etiology.

As a predisposing factor, vasomotor irritability plays an important part, rendering the subject peculiarly susceptible to the effect of irritants from without and of toxins and reflex transmissions within the economy. In view of this fact, it is evident that the diseases comprising this group are not distinct affections due to a single causative element, but are naturally varied in their manifestations from the multiplicity and diversity of the factors which produce them. These may be classed as external or direct, and internal or indirect sources of irritation. The *external* irritants are those of heat and cold; friction and pressure; bites and stings, as of jellyfish, fleas, etc.; acrid discharges; vegetable substances, as mustard, chrysarobin, rhus

toxicodendron, etc.; and certain chemicals, as croton oil, mercury, sulphur, cantharides, iodoform, acids, alkalies, etc. Among the *internal* or indirect sources of irritation may be mentioned reflex excitation from psychic disturbances; the toxins of some infectious fevers; the poisonous action of certain drugs; disturbances of internal organs, especially of the stomach and of the female genitals acting reflexly upon the cutaneous nerves; and in some instances rheumatic poisoning.

Pathology.

Erythema simplex depends solely upon the injection or dilatation of the capillaries and the smallest veins. It is purely a vasomotor disturbance affecting the inhibitory nerves and resulting ultimately in their paralysis.

Diagnosis.

With a thorough understanding of the symptomatology of the various forms of erythema simplex, little difficulty should be experienced in the matter of diagnosis. The constitutional disturbances accompanying the exanthemata and their subsequent course will soon remove all doubts in regard to their nature. Erysipelas is marked by grave constitutional and febrile disturbances which are absent in erythema simplex, and the eruption itself has distinctive characteristics in the sharp definition of the patches and their raised surface. Certain lesions of urticaria simulate very closely erythema simplex, but sooner or later the evanescent wheal characterizing this affection makes its appearance.

Not all of the diseases originating from the causes above enumerated are studied in this group, certain of them falling more properly into other categories, or receiving due attention in the description of those diseases of which they are an integral part. Some of the diseases caused by external irritation are, therefore, described under Dermatitis—*e.g.*, those produced by the action of certain vegetable and chemical substances locally upon the skin, also by bites and stings, and designated by the name, dermatitis venenata. Likewise under the heading Dermatitis medicamentosa will come the erythemata resulting from the ingestion of certain drugs. Erythema gangrænosum is the name applied to self-induced lesions occurring sometimes in hysterical women from the application of acids, caustics, or thermal agents, and constitutes one of a group called "feigned" skin diseases. The exanthemata appear elsewhere for similar reasons, as also the eruptions of the infectious fevers. Pellagra and

acrodynia, two allied diseases, are properly trophoneurotic affections and will be dealt with under that heading.

In accordance with the varied etiology of hyperæmic erythema or erythema simplex, two subdivisions of this group are made: (*a*) Idiopathic erythema, that in which external causes act as exciting factors; and (*b*) Symptomatic erythema, that due to internal causes.

(*a*) Idiopathic Erythema.

This group comprises E. traumaticum, E. caloricum, E. intertrigo, and E. læve.

Erythema Traumaticum.

As its name implies, this affection is due to mechanical friction or pressure upon a limited area of the skin. Localized congestion or redness is the only symptom produced, which quickly fades when the exciting cause is removed, but which goes on to inflammation and sloughing when the cause is frequently repeated or is long continued. It may be excited by rubbing or friction of the skin, such as might be produced by tight bands of the clothing, especially about the waist from the corsets, and about the limbs from garters and sleeve straps; also from contact with acrid discharges, nasal, leucorrhœal, etc., as well as decomposing secretions, especially the sweat.

Erythema neonatorum is the name applied to a diffuse redness of the skin of infants developing shortly after birth and rarely remaining after the first week of life. While it is generally conceded to be a nervous affection, an exciting factor in its production is irritation of the delicate skin from bathing, manipulation, and the pressure of the clothing, as well as from exposure to the atmosphere and extremes of temperature.

Erythema paratrimma is an obsolete term used to designate the erythema due to continued pressure, its effects being most marked over bony prominences such as the tubera ischiorum, the trochanters, iliac crests, sacrum, and spinal column. Protracted recumbency, associated with lowered vitality and oftentimes the irritation of excreta, is sure to lead to this condition and ultimately to bed-sore if the greatest care is not observed.

Erythema intertrigo receives a separate description, though in a measure it is an example of erythema traumaticum.

Localities the seat of erythema traumaticum are, from their necessarily lowered nutrition, especially predisposed to inflammatory changes when intercurrent diseases supervene. Eczema, bullous and pustular lesions, etc., often develop in an aggravated form in

these places. I have seen thickly set papules of seborrhœic eczema arranged in two well-defined bands crossing a man's back in the line of the suspenders, and in the same patient a wider and less sharply defined tract around the waist under the band of the trousers. One of the best illustrations I have observed was in a man who developed a large serpiginous syphilide on the back of the neck. The process had its inception at the point of pressure of the collar button and extended over an area of eight or ten inches. I have observed the same caused by the irritation of an unprotected corset-steel. It is also well known that the eruptions of variola, scarlet fever, measles, etc., are more pronounced in regions subjected to pressure. One frequently observes a very aggravated form of scabies on the buttocks and thighs of patients whose occupations subject them to long sitting in one position.

Treatment.

This form of erythema simplex calls for no treatment further than to remove the source of irritation, except in the case of erythema paratrimma, so-called. Our endeavor in these cases should be to protect the parts from pressure as much as possible by supporting the weight of the body on circular pads or cushions, or by placing them upon a water-bed. The urine and fæces must not be allowed to come in contact with the threatened part, and frequent bathing with alcohol or other stimulating remedies will be necessary to restore nutrition. Every effort must be made to improve the general condition of the patient at the same time. After most careful nursing and treatment in this manner, if ulceration occurs it must be treated by ordinary antiseptic measures.

Erythema Caloricum.

Under this designation are included erythematous affections resulting from exposure to both heat and cold, and to the atmosphere in a state of motion. There is reason to believe, however, that in the case of heat the effect is produced by the chemical rays of light and not by the heat, as commonly supposed. Charcot was the first to make this observation in 1859, but Hammer[1] has recently studied the subject more fully, and Bowles[2] also has made some very important observations in this connection. These latter referred mainly to the influence of the rays reflected from snow-covered surfaces. It is thought that the violet or ultra-violet reflected rays are responsible for the effect. Charcot has also observed an erythema differing in no way from sunburn produced by the action of the electric light.

Heat from the fire may likewise cause an erythema, *erythema ab igne* (Crocker). This affection is usually observed in cooks and stokers and in those who expose their legs frequently and for extended periods before the fire. Erythematous rings and gyrate figures of a deep-red color are thereby produced on the fronts of the lower legs, which fade gradually if the cause is removed, leaving a brownish pigmentation. This may simulate very closely the pigmentation caused by varicosities and by syphilis in this location.

The action of cold upon the skin producing hyperæmia and lividity is well known. *Erythema pernio* (*chilblain*) will be considered under the heading Inflammatory Erythema.

Symptoms.

The symptoms of erythema caloricum are diffuse redness confined to the parts exposed, with a sensation of burning and tension; the redness at first is of a bright-red color but changes to a red-brown upon repeated exposure. Desquamation results in certain cases. *Erythema solare* is the term commonly applied to the foregoing group of symptoms.

When the exciting factor is removed, the skin gradually returns to its normal condition.

Erythema Intertrigo.

By some this affection is classed as an eczema, and by others as an erythema. The difficulty seems to be due to the fact that both eczema and erythema occur in the localities subject to intertrigo, and careful attention is necessary to differentiate them. Erythema intertrigo is a hyperæmic affection occurring in parts where two opposing surfaces of skin come together, and is observed mainly in fat people and in infants. Its usual location is in the inguinal regions, but it also occurs in adults about the neck, in the axillæ, in the fold at the lower part of the abdomen, and beneath the female breasts. In infants it is likewise often observed about the neck, wrists, and in the folds of the legs.

Symptoms.

The symptoms are a diffuse, bright redness, usually sharply defined, accompanied by more or less exudation of a thin watery fluid or one of a slight purulent character. This fluid does not cause the marked stiffening of linen that we see in true eczematous exudation. The subjective symptoms are smarting and itching.

Etiology.

The causes are friction, heat, moisture, and in infants the irritation of napkins wetted with urine and fæces. The pernicious habit of drying the napkins before the fire and reapplying them without washing, is accountable for many cases, as is also washing the napkins with strong irritating soaps.

Diagnosis.

It is important to differentiate this disease from eczema, especially from *eczema seborrhœicum* which frequently occurs in the localities above enumerated; success in treatment depends much upon this fact. In seborrhœic eczema there is generally to be found some evidence of the eruption upon the scalp or elsewhere upon the body. Likewise it does not remain confined to the area subjected to irritation but progresses at the periphery. In infants, for example, with eruption in the inguinal regions, it is seen to progress at the periphery and extend to the lower abdomen, down the thighs, and on to the buttocks. The formation of small papules beyond the border of the eruption, which also enlarge peripherally and merge into the main area, as described by Elliot, I believe to be very distinguishing features of a seborrhœic eczema in this locality. The color, too, is a dull but shining red in contradistinction to that of an erythema intertrigo.

From *congenital syphilis*, which frequently occurs as a diffuse erythema upon the buttocks and inner surfaces of the thighs of very young children, careful differentiation must be made. In every case of this form of syphilis that I have observed, the infants were extremely emaciated and showed the constitutional effects of the disease in a marked degree. Babies suffering from simple intertrigo are, on the other hand, almost invariably well nourished. In congenital syphilis the eruption is also present on the palms and soles, and spreads very rapidly over the body and limbs in a diffuse manner, not confining itself to the usual seat of an intertrigo. Intertrigo may sometimes be confounded with *eczema marginatum* (*tinea cruris*), which may occur, not only in the groins, but in the axillæ, etc. The height of the process in intertrigo is along the line of junction of the two surfaces, becoming less severe near the border. In tinea, on the other hand, the disease is most active at the border, which is raised and festooned in a characteristic manner. The color is likewise not so bright in ringworm, and finally microscopical examination of scrapings from the edge of the patch will reveal the mycelium of the trichophyton fungus if we have eczema marginatum to deal with.

Treatment.

The first thing necessary is to separate opposing surfaces, and this is best accomplished by laying a strip of lint or absorbent cotton between them. The heavy swaddling that is practised in infants, especially in those of the poorer classes, should be avoided, and only the lightest covering possible allowed. The napkins, as soon as they are wet or soiled, should be replaced by others that have been washed and not by those that have been dried by the fire; the diseased surface should first be cleansed and dried carefully. Too much washing is harmful unless it is done with antiseptic solutions. Boracic acid in four-per-cent. solution is best adapted to this purpose. Dusting powders are advocated by many, but in my experience they become caked by the secretions and act as a source of irritation. Exception may be made, however, to the stearates, a class of agents recently brought to the notice of the profession. They are impalpably fine powders, which are greasy to the feel, in virtue of which property they do not absorb the secretions so readily, and therefore produce less caking. The stearate of zinc with salicylic acid is best suited to an intertrigo. The oleate of zinc, fullers' earth, kaolin, and talc may also be mentioned as remedies that are less liable to produce irritation from caking.

The best results are obtained, however, by the alternation of remedies. I have found that wiping the surface over with a watery solution of ichthyol in six-per-cent. strength, then applying, on lint, zinc ointment containing three per cent. of salicylic acid, is a most effective line of treatment. Lotions as a rule act better than ointments, and those with powders in suspension are to be recommended. A lotion of calamine and zinc of the following composition is very serviceable:

℞ Acidi carbolici, ... ʒ ss.
Pulv. calamini prep., ... ʒ i.
Zinci oxidi, ... ʒ ij.
Glycerini, ... ʒ iij.
Aquæ calcis, ... ʒ iv.
Aquæ, ... q.s. ad ℥ iv.

M. This should be sopped on several times daily, and lint wet in it can be placed between the surfaces with advantage.

In infants diarrhœal disorders, worms, etc., must receive appropriate treatment in addition to the local measures. It might be incidentally mentioned in this place that if there is any doubt about there being a seborrhœic element in the case of a given intertrigo, the use of resorcin in lotion or ointment, one to three per cent., will soon clear up the matter.

Erythema Læve.

This term is fast becoming obsolete. It was applied first, I believe, by Willan, to designate the hyperæmia which frequently accompanies the swelling in œdematous limbs; it is seldom seen in the anasarca of cardiac or hepatic disease. Pye-Smith gives as his reasons for believing that it is not uræmic the fact that many severe uræmic cases do not have the eruption and that when it does occur it is unaccompanied by uræmic symptoms. When associated with chronic nephritis he regards it in the same light as the pleurisy, œdema of the lungs, retinitis, pericarditis, laryngitis, peritonitis, etc., observed in patients with kidney disease. The disease most frequently affects the lower legs and the skin is very tense, red, and shining. Unless relief is obtained, vesiculation and even ulceration will result. The use of a Martin rubber bandage during the daytime and of some astringent and antiseptic lotion at night is to be recommended.

(*b*) Symptomatic Erythema.

The affections comprising this class are due to irritation of the nerve centres from various causes acting in a reflex manner upon the cutaneous surface. Some of them, which are symptomatic manifestations of specific fevers, or are due to an idiosyncrasy on the part of some people towards the action of certain drugs, are not considered here, for reasons before stated. Those receiving attention are, E. pudicitiæ, iracundiæ, E. roseola, and E. scarlatiniforme.

Erythema Pudicitiæ, Iracundiæ.

While this name represents no disease, pathologically, simple mention is made of it from the fact that it appears frequently in textbooks and literature and a word in explanation of its meaning seems appropriate. It is the term applied to the purely physiological act of blushing, which is the reflex manifestation of a psychological impulse reflected from the nerve centres to the vasomotor nerves of the skin. This impulse is excited by the emotions or special senses, and is usually reflected to the face, but in some cases may extend over the forehead into the scalp and down the neck on to the upper part of the back and chest.

Erythema Roseola.

Roseola is a term which is very often improperly used, for it only indicates the form of erythema and not the nature of the affection which causes it. Much confusion may be avoided, however, when

employed, if it is confined to those erythematous manifestations which occur in the course of, or accompany many febrile and specific affections. Thus *roseola syphilitica* would designate the macular eruption marking the onset of syphilis, *roseola variolosa* that occurring in the course of small-pox, *roseola vaccinia* that which sometimes follows the operation of vaccination, *roseola cholerica* that seen in the convalescent stage of cholera, *roseola febrilis* the erythema sometimes seen in malarial poisoning, *roseola typhosa* that of typhoid fever, etc., etc. *Roseola infantilis* is a name commonly given to certain erythemata which occur in infants or young children sometimes in the course of a cerebrospinal meningitis, bronchopneumonia, etc., but more commonly as a result of dentition or gastric and intestinal disturbances. It is ushered in with prodromes, as slight fever, restlessness, and accelerated heart action, but as a rule there are no throat symptoms. While the eruption may often resemble scarlatina, the course of the temperature and the absence of catarrhal symptoms will make the diagnosis clear. The eruption may appear in various forms but is usually in the form of macules, the largest about the size of a pea, or in a fine papular rash very similar to scarlatina. It may occur on the body, limbs, or head, but is seen most marked on the abdomen and sides of the trunk. It may last for a few days or for a shorter time and disappear without desquamation. *Erythema fugax* of some authors is closely allied to, if not identical with, this affection, although it is said sometimes to occur in adults. Several years ago I had occasion to see many cases of roseola infantilis appearing in the sufferers from an epidemic of cerebrospinal meningitis in a neighboring town, and although the manifestations were varied and confusing, careful consideration of the features here enumerated soon revealed the nature of the disorder.

Erythema Scarlatiniforme.

The literature of this disease during the past few years has become very complicated, and to those more or less unfamiliar with skin affections, a clear understanding of the subject has thereby been fraught with much difficulty. While much of our knowledge of this affection is due to the recognition and elaboration of it by French dermatologists, we are, nevertheless, constrained to believe that unnecessary complexity has resulted from their attempts at refinement. Besnier[1] draws at length a distinction between scarlatiniform and scarlatinoid erythema, taking differences in their acuteness, temperature, and duration as a basis for their separation into distinct classes. He admits, however, that the two classes differ but little in their objective symptoms, if indeed there is any difference. I am fully in

accordance with the views expressed by Elliot,[4] namely: "It would appear natural to expect higher febrile reaction when the eruption developed in association with an already pyretic process—septicæmia, pyæmia, toxæmias of various kinds—and the acuity of the clinical symptoms would also vary according to the intensity of the toxæmic inducing cause, . . . while the basic pathological process in each of a series of cases would necessarily stamp upon each this or that difference in duration, clinical manifestations, extent, or intensity of course."

Brocq[5] describes the affection also, under the name of "desquamative scarlatiniform erythema." The cases so designated by Besnier, Brocq, and others are of a severe type, though the eruptions are practically the same. The temperature is higher (104° or 105° F.) and the course of the disease is longer (six weeks or more). The mucous membranes, including the conjunctivæ, are more often involved, and the hair and nails are sometimes shed, the latter being marked by deep furrows. We believe all these to be scarlatiniform erythema, differing only in severity, for reasons before stated, and whether some of them are really mild forms of "general exfoliative dermatitis" (pityriasis rubra) as stated by Brocq, is yet to be determined.

Definition.

Scarlatiniform erythema is a febrile affection, occurring idiopathically or as the result of a great variety of causes, its most distinguishing feature being an eruption very similar to that of scarlet fever; it is not contagious or infectious and is liable to frequent recurrences.

Symptoms.

The course of the disease may conveniently be divided into three stages—namely, invasion, eruption, and desquamation. The period of *invasion* is marked by general malaise, lassitude, slight rigors, and usually a moderate fever (101° to 102° F.). The fauces are slightly injected and there may be mild angina; there is no diarrhœa and seldom anorexia or nausea. The tongue is generally foul, or may present minute red papillæ covering the tip and sides, but is not of the true "strawberry" type. Sometimes it has a glazed, raw appearance. The fever reaches its height in two or three days, but usually subsides quickly, though occasionally it becomes remittent or continuous. Perspiration is generally lessened and sometimes suppressed. In one of my cases there was severe hæmaturia which preceded the eruption and marked the onset of each subsequent relapse.

The *eruptive* stage sets in sometimes suddenly but usually in a day or two. The first manifestation of the rash may appear anywhere, there is no chosen or favorite locality for it, and it may even appear simultaneously in several places; the face, however, is usually not the first part affected. In some it begins at the upper part of the body and travels downwards (Féréol). Wherever it begins it spreads and becomes general very quickly, sometimes in twenty-four hours.

Fig. 51.—Epidermic Glove; Palmar Surface. One-half natural size.

All cases do not become universal, however, the eruption being often limited to certain localities; this is particularly true of the relapsing eruptions. The lesions are at first usually punctiform or very small papules which coalesce into variously sized patches, or patches may appear here and there and coalesce to form diffuse areas, or the eruption may be diffuse from the beginning accompanied with some swelling of the skin. In a case to be described below, swollen red patches like a burn from a mustard plaster, appeared first in the bend of the elbows and in the groins, from which localities the rash spread rapidly over the body. When fully developed the rash resembles very closely that of scarlet fever, although sometimes hemorrhages (petechiæ) occur, and also pretty general œdema or localized œdematous areas. Small miliaria vesicles are also an accompaniment in rare cases. The color of the eruption, when completely developed, is usually a bright uniform red, the shade, however, may be lighter or darker according to the locality.

Desquamation usually sets in at about the fourth day, though it may be delayed to the eighth or tenth day. Sometimes it commences

in the regions first involved before the process has reached its height in the more remote areas. In those cases in which the eruption spreads more slowly, therefore, desquamation may be going on in one place while the eruption is extending in another. In some instances desquamation is said to take place where there has been no eruption. The scaling may be furfuraceous or in the form of large thin flakes, or the epidermis may be thrown off *en masse*, according to the localities involved.

On the scalp, eyebrows, and bearded face, as also over articulations as the elbows and knees, the scaling is furfuraceous; large flakes or lamellæ may form on smooth areas as of the trunk; and the epidermis of the hands and feet may be thrown off completely in the form of gloves or socks, in which case the skin underneath remains red and tender for a few days. In any case, the desquamation is very abundant, the duration of the process varying from one to six weeks. In certain cases, as already mentioned, the hair and nails may be shed.

FIG. 52.—Epidermic Glove; Dorsal Surface. One-half natural size.

The *subjective symptoms* are burning, pricking, smarting, or itching which may be marked or only moderate in intensity. The duration of the eruption varies with the intensity of the morbid process and the rapidity with which it spreads; it generally lasts five or six days and is followed by desquamation in the majority of cases. The disease may end in one attack, but relapses are the rule. The first attack is liable to be more severe than subsequent ones. There is no regularity about the relapses, they may occur at long intervals, the patients having but one or two a year, or they may skip several years, the general health being

unimpaired in the intervals. On the other hand, the attacks may be frequently repeated every few months, or, in fact, may follow each other in close succession, so that the number of attacks that a given patient may have is indefinite. Tilbury Fox had a patient who sufered one hundred attacks.

Various complications, as pulmonary, cardiac, renal, gastro-intestinal, etc., are associated with this disease according to some authors, but it is highly probable that the causes producing the erythema are elements in their production, or that the erythema is a symptomatic manifestation of these disorders.

The following case furnishes a fairly typical clinical picture of this most interesting affection. For the notes and the specimen from which the photographs were taken (Figs. 51 and 52) I am indebted to Dr. James W. McGee, Jr., of Raleigh, N. C.:

The patient is a young man of 24 years who has always enjoyed the best of health except for the repeated attacks of skin eruption. His physical development is unusually good and his family history is entirely negative. The first attack occurred when he was three years old and at the time of observation he was recovering from his thirteenth attack. The attacks seem to come on with some regularity, lasting from two to three weeks. Whether any particular season of the year exerts a determining influence I am unable to state. The eruption is preceded by a few days of general malaise, lassitude, coated tongue, and a slight fever, simulating closely a beginning malarial attack. A scarlet blush beginning in the folds of the elbows, in the groins, axillæ, etc., spreads gradually over the entire body. The temperature soon reaches 104° to 105.8° F. The eruption, when fully developed, has the appearance of a huge sun-burn or perhaps resembles more closely the burn of a mustard plaster. An intense burning sensation is felt all over the body. In from three to five days the fever subsides, the redness very slowly disappears, and a general desquamation begins; every inch of the skin, even that on the scalp, peels off—hands like gloves, feet like slippers with toes, etc. The appearance of the face and neck at this time is very much like the desquamation of scarlet fever; the skin on the body, however, comes off in great flakes. The new skin underneath is very red and quite tender for a few days, but in a short time the patient is out again, feeling none the worse for his experience. The hair and nails have never been shed in this case.

Etiology.

The cause of this disease is never an exclusive one, and Besnier states that the eruption depends upon the subject himself. He asserts that a predispostion must exist or the disease will not manifest itself as a result of either internal or external causes. Predisposition certainly plays a most important part in the majority of

cases. The disease may occur at any age but is more common in early adult and middle life or in children. From the recorded cases it would appear to be more common in males than in females. Seasonal influence is not at all certain, though cases have been known to relapse at the same season of the year. In very many instances no definite cause can be determined; these constitute the idiopathic cases. It has been observed after surgical operations and simple wounds non-septic in character, a fact which seems to stamp certain cases as simple vasomotor disturbances. It very commonly occurs, however, in the course of septicæmic and pyæmic conditions, as an accompaniment of puerperal peritonitis, and when there are pus cavities as empyema and tuberculous abscesses; also in gonorrhœa even when no copaiba has been given. The disease is thought to be less common since the advent of antiseptic surgery. It may occur in the course of certain specific fevers as variola, typhoid fever, diphtheria, etc. In chronic Bright's disease a uræmic scarlatiniform erythema is sometimes seen. Other auto-intoxications from ptomaine poisoning have been recorded, such as from tuberculin injections and sewer-gas poisoning (Crocker). It is also frequently observed in connection with rheumatism and ague, the latter especially in children. I have been told that it is very common along the lowlands bordering the lower Mississippi River. Elliot[8] records a personal case in which the rash appeared at every menstrual period, the exciting factor being a prolapsed and enlarged ovary. The ingestion of certain foods has been known to produce the eruption, notably shellfish (particularly molluscæ), some fruits, vegetables, etc. It is also an idiosyncratic manifestation from the action of certain drugs—*e.g.*, ether and chloroform by inhalation, chloral hydrate, belladonna, quinine, opium, copaiba, mercury, antipyrin, the salicylates, etc. (see *Dermatitis Medicamentosa*). Recently Allgeyer and Sprecher[9] have reported a case of scarlatiniform erythema in a girl of seventeen years, following intra-muscular injections of bichloride of mercury in the treatment of syphilis. Alcoholism is likewise responsible for some cases. Among external causes may be mentioned exposure to very high temperatures, mercurial inunction, sulphur and other mineral baths, etc.

Pathology.

The pathological anatomy of scarlatiniform erythema is obscure; whether it will prove to be that of general exfoliative dermatitis, as Brocq would infer, remains yet to be ascertained. The manner in which the various causes act to produce the skin lesions is manifestly different in different cases. We only know that some undoubtedly produce an inhibition of the peripheral vasomotor

nerves, through irritation of the nerve centres, in patients who are peculiarly predisposed to the action of certain agents. In other cases the same effect is produced through the action of specific or other toxins within the system.

Diagnosis.

The most important feature connected with scarlatiniform erythema is its very close resemblance to *scarlet fever*. This, however, only obtains as regards the rash, for upon careful observation of the other features of the two diseases, differentiation should be easy. It may be remarked, however, that in certain cases the resemblance is so close in every particular that experienced observers cannot differentiate them in the first few days. In this case, isolation is the only safe procedure. In view of the foregoing facts it is highly probable that some of the reported recurrences of scarlet fever are, in truth, examples of scarlatiniform erythema; this supposition gains credence from the fact that these so-called recurrences are generally mild in character. There is one feature, however, which distinguishes them that is more valuable perhaps than any other, and that relates to the period in the disease at which desquamation begins. In scarlet fever desquamation seldom begins before the tenth day, while in this disease it begins on the fourth day and sometimes earlier. It is also over quickly in scarlet fever, but may last several weeks in scarlatiniform erythema. The rash itself is often not so general as in scarlet fever, and the history of previous attacks would likewise be helpful. The constitutional symptoms are not as a rule so marked as in scarlet fever, the temperature often being only 100° or 102° F., which falls quickly unless the erythema is a part of some severe general disorder. Likewise, the throat is only slightly reddened and not swollen, and the typical "strawberry" tongue is absent. Uræmic erythema is readily distinguished by the detection of an existing nephritis and also by the age of the patient.

The morbilliform erythema may possibly be confounded with *measles*, but the coryza and constitutional symptoms would be absent and the eruption would be more likely to begin anywhere than on the face in erythema scarlatiniforme. In *rötheln*, or German measles, the adenopathy referable to the cervical and submaxillary glands will furnish a ready point of distinction. This is not present in morbilliform erythema. The non-contagious nature of this affection must be remembered in making a diagnosis from any of these diseases, for a discovery of others similarly affected would decide the matter at once. The subsequent course with periods of subsidence and relapses will distinguish this disease from *pityriasis rubra*.

Prognosis.

The prognosis in the majority of cases is favorable; this is particularly true in the idiosyncratic cases, although it can never be told how many subsequent attacks a given patient may have. Neither can one tell when, if ever, any particular drug, article of food, or what not, will cease to excite the eruption. The prognosis in certain cases is grave; this is particularly so when the affection appears in the course of chronic Bright's disease. It is likewise liable to be serious when the erythema is symptomatic of grave systemic poisoning, as septicæmia, pyæmia, etc.

Treatment.

It is obvious that the first thing to do is to ascertain the exciting cause if possible and remove it. This is often found to be impossible, in which case the treatment must be symptomatic. If there is any doubt about the diagnosis it is better to put the patient to bed and treat as a case of scarlet fever. Mild remedies should be employed in all cases, diuretics and saline aperients are indicated, but drugs in general that have a tendency to produce rashes should be avoided. I would make exception of one, however, in certain cases, but great care must be exercised in the selection of the cases. I refer to quinine. Although this is a drug which commonly produces the eruption, in the ague cases it has always been effective in my hands, the eruption subsiding after two or three days under the administration of six grains a day in divided doses. Arsenic should be strenously avoided in all cases. The local treatment is of little consequence. If there is itching or burning, calamine and zinc lotion will speedily allay the irritation. Desquamation may be assisted by the use of alkaline baths followed by a general anointing with oil or vaseline.

(2) INFLAMMATORY ERYTHEMA.

The diseases in this group represent the pathological process a step in advance of that characterizing those just considered. Active congestion becomes passive from retardation of the current resulting in stasis, and exudation follows with escape of leucocytes into the surrounding tissues. Blood extravasation may likewise occur.

The group comprises E. pernio, E. exudativum multiforme, E. nodosum, E. induratum, and Peliosis or Purpura rheumatica.

Erythema Pernio.

This affection, commonly called "chilblain" develops on regions of the body situated remote from the heart and is distinctly a disease of cold weather. The hands and feet are the usual sites, but the ears, nose, and cheeks may sometimes be attacked. It is characterized by erythematous patches of a dusky or livid red color, on a slightly swollen skin, the redness merging gradually into the surrounding parts. It involves mainly the sides and dorsum of the fingers and borders of the feet; the heel is almost always affected. The subjective symptoms are tenderness and very intense itching and burning, when the parts get warm. Slight desquamation may follow the subsidence of the inflammation. If the condition is neglected, more marked inflammatory changes take place, resulting in vesiculation and ultimately in ulceration. *Frost-bite*, a late stage of this process, has been considered in a former volume.

Etiology.

The exciting factor in all cases is the action of cold upon extremities in which there is a sluggish circulation. It is more common in childhood, adolescence, and old age, the subjects having habitually cold hands and feet, usually with moisture. Strumous children are particularly subject to the disease because of their anæmic constitutions, but chilblain should not be considered of tuberculous origin on this account.

Pathology.

Pathologically, the terminal arteries are first contracted by the action of the cold, after which a dilatation occurs from vasomotor paralysis, and finally inflammation.

Diagnosis.

The circulatory condition upon which the occurrence of chilblain depends is likewise a predisposing factor in the production of *lupus erythematosus*, with which disease it may sometimes be confounded. Erythematous lupus may affect both fingers and toes, ears, etc., but it persists in summer as well as winter, it has a very long course, the itching and burning are absent or only slight, and there is more or less infiltration of the affected tissues, and scaliness. Pressure atrophy, resulting in permanent scars, sooner or later characterizes lupus erythematosus, and it is rarely that one does not find evidence of it, either in the form of atrophic scars or the disease itself, on the face, tips of the ears, or through the scalp.

Treatment.

Prophylaxis is of prime importance in the treatment of chilblain, and efforts must be made to keep the circulation active. The parts should be kept warm by woollen gloves or stockings, and exercise, as jumping, running, and walking, should be encouraged. Hot water should be used in washing and great care exercised in drying; brisk rubbing with a towel or white flannel is useful if the parts can bear it. General tonic measures are also required, directed mainly towards the anæmia and the circulation. Iron, Fowler's solution, and cinchona may be mentioned, and in the case of strumous children the syrup of the iodide of iron. When vesiculation occurs, Fowler's solution, two to five drops every two hours, for a day or two, often results in complete relief. Digitalis and nitroglycerin are to be recommended, according to indications, in adults.

Locally, the application of a ten-per-cent. ichthyol ointment at night, and the use of calamine and zinc lotion in the daytime are very effective. The lotion should be applied several times a day, and the effect is often enhanced by painting the parts once or twice a day before applying the lotion with a mixture containing a drachm of glycerin in an ounce of tincture of iodine. In the same manner, a ten-per-cent. watery solution of ichthyol may be applied, and when dry covered with the calamine and zinc lotion. Permanganate of potash in a watery solution of three- to four-per-cent. strength, beginning first with the weaker solution and applying it twice a day, is a very efficacious remedy. If ulceration occurs, it must be treated on general surgical principles.

Careful attention to the details first enumerated and intelligent use of the internal and external remedies as indicated, will rarely fail to give gratifying results in this often most distressing affection.

ERYTHEMA EXUDATIVUM MULTIFORME (Hebra).

This name has been applied to a disease which exhibits an infinite and manifold variety of clinical pictures, because of the varied and protean character of the lesions manifested. Kaposi prefers the name *erythema polymorphe*, but the disease is better known under the name here given. The lesions may be macular, papular, nodular, vesicular, bullous, or hemorrhagic, occurring alone or in combination, and presenting efflorescences differing in shape, size, elevation, color, and arrangement. To these clinical types separate names have been given to indicate the particular lesions predominating at the time of observation. It must be remembered, however, that they

simply designate particular phases of the disease and do not constitute a disease by themselves.

Definition.

An inflammatory affection of the skin, characterized by lesions, multiform in shape, size, elevation, color, and arrangement, which are inclined to symmetry and special localization.

Symptoms.

The eruption is usually ushered in with slight constitutional disturbance, which may either accompany it or precede it by a few hours or a day or two. These symptoms will also vary in intensity and character according as the affection occurs idiopathically or in the course of some general systemic disease. These *prodromal* symptoms are general malaise, pain in the back, limbs, or head, slight pharyngeal congestion, gastro-intestinal disturbances, and chilly or creepy feelings with a varying temperature. The temperature may be entirely absent or only slight (100° to 101° F.) or it may reach 104° to 105° F. In children the general symptoms are more marked and the temperature higher. The fever generally subsides when the eruption appears, but there may be an exacerbation with the occurrence of each efflorescence; complete subsidence does not occur until the rash is all out. In a great many instances all of these prodromal symptoms are absent, the most constant symptom being pain in the joints.

Localization.—The distribution of the eruption is always symmetrical, though absolute symmetry does not often obtain, one side generally being more affected than the other. It makes its first appearance, as a rule, upon the backs of the hands and almost simultaneously on the dorsum of the feet, from which localities it spreads up the arms on to the neck, face, and trunk and up the fronts of the legs to the thighs. Hutchinson says the eruption never omits the fronts of the legs; however true this may be, it is certainly seldom that the backs of the hands are not affected. It is almost always limited to one or two localities. There is great variation, however, in its mode of inception, for it may be entirely absent from these usual points of predilection. Pick[8] reports a case in which the eruption was confined to the trunk, it never having appeared on the hands, feet, limbs, face, or neck. Exceptionally it may attack any part of the body first, the face, trunk, or extremities, or it may simultaneously appear at remote foci and spread in various directions, even becoming general. Coulaud[9] records a case of Peter's in which the eruption first appeared on the palms of the hands, and Elliot has seen several

instances in which the palms of the hands were affected in the course of the disease. The mucous membranes of the mouth, pharynx, tongue, conjunctiva, vagina, etc., may also suffer. Cases have been reported also in which the disease began on a mucous membrane.

Clinical Manifestations.

The eruption itself is distinctly polymorphous; there may be but one form of lesion, the process stopping there, but more often evolution takes place with the production of papules, vesicles, bullæ, etc. Fresh efflorescences may appear in one place while involution is going on in neighboring lesions and papules, vesicles, and bullæ may coexist on the same patient.

Erythema papulatum.—This represents the commencement of the process and is the most common variety met with. There appear isolated or aggregated papules, varying in size from a pin's head to a split pea, which are moderately raised and convex or flat on the top. To the touch they feel slightly firm or œdematous but not distinctly hard. Their color is a bright or dusky red which disappears under pressure. Their duration is short, seldom lasting longer than a week and often only a few days, and they are followed by slight desquamation in some cases. Pigmentation usually marks the site of the lesions, but this, too, quickly fades.

Erythema tuberculatum.—This is an exaggerated form of the preceding variety. The papules, if closely arranged, enlarge peripherally and coalesce into raised, dull red, sharply defined patches of various sizes and shapes; or an individual papule may enlarge to the size of a nodule or tubercle.

Erythema circinatum or E. annulatum.—While the patches just described are advancing at the edge, involution begins at the centre, resulting in the formation of a ring of varying circumference. These rings have a raised, red, or scarlet border enclosing a pale, bluish-red depressed centre, well meriting the name here applied to them.

Erythema iris.—If a papule forms in the centre of this ring and goes through the usual stages of evolution, several concentric rings are produced. As a result of absorption and evolution of new papules, zones of color varying from blue or purple to pink appear, constituting erythema iris.

Erythema gyratum or E. figuratum.—This condition results when several circles of erythema annulatum, in the process of enlarging, coalesce. The rings at the point of contact become effaced and the remaining segments are joined into gyrate figures or delicate wavy lines. A similar effect is produced when one portion of a ring undergoes involution while another is progressing.

Erythema marginatum.—Crocker gives this name to a variety of erythema multiforme closely allied to erythema gyratum. In his description he speaks of it as a flat disk, which rapidly enlarges peripherally, while involution takes place in the centre. These, coming in contact with similar lesions, produce sinuous broad bands, sloping towards the centre and abrupt at the border. Rolling onwards they may traverse the circumference of a limb or a large area on the trunk in a few days. Fawn-colored pigmentation results which disappears slowly.

Erythema urticatum.—The term *lichen urticatus*, which is synonymous with this variety of erythema multiforme, is often employed in a manner to lead one to suppose that it represented a disease *sui generis*. The condition is produced by the enlargement of the primary papule, through increased exudation, to the size of an urticarial wheal. These papules usually itch violently and soon present a black blood crust on their summits as a result of scratching. They go through the same process of evolution as the preceding varieties and form patches from a pea to a penny in size. A blood crust marks the centre, on a bluish-red depressed base, the surrounding border being red and elevated.

Erythema bullosum.—Vesicles and bullæ may form accidentally upon any of the lesions that have been enumerated. The bullæ develop primarily or result from the coalescence of vesicles. They occur alone, grouped, or more commonly mixed with the other lesions, papules, tubercles, annular or gyrate patches, etc. Their contents may be clear or opaque, and frequently hemorrhages take place into them, but ulceration never occurs. The crusts resulting from their rupture and desiccation fall off, leaving only pigmentation which slowly fades. A severe and serious form of erythema bullosum has been observed, however, in which the cutaneous surface is more or less generally involved, the inflammation extending to the subcutaneous connective tissue, implicating the lymphatic vessels and glands. In these cases ulceration may occur beneath the crusts, and bullæ may appear on the nasal and buccal mucous membranes.

Herpes circinatus and Herpes iris.—The clinical features represented by these titles are generally accorded a separate description by dermatological authors, a distinction which for certain reasons seems quite warrantable. The lesions occur independently of those previously described and run a course sufficiently uniform to constitute almost a disease entity. Most modern authorities, however, concede that they are manifestations of erythema multiforme and do not represent a disease *sui generis*. For the sake of unifomity, therefore, they will be considered in this instance as special varieties of ery-

thema multiforme, though the due prominence will be given to them that their importance demands. Herpes iris, it may be stated, was classed by the older writers with the herpes group, but the identity of these processes can no longer be maintained.

When the type of lesion represented by erythema urticatum, already described, goes on to further exudation, one gets the formation of vesicles; the central crusted lesion sinks in, revealing a bluish-red depressed base, and upon the raised red border a ring of vesicles develops. This constitutes *herpes circinatus*. A few hours after the appearance of a primary papule a vesicle may form upon it. The lesion then enlarges and is encircled by a narrow red zone, the central vesicle at the same time drying up into a scab or crust; a ring of vesicles next develops upon the margin, and as evolution goes on another red zone appears beyond the primary one and upon this another ring of vesicles forms. By a repetition of this process there is finally produced a lesion that has been likened to a target. There is a central crust or perhaps a vesicle, surrounded by a bluish-red area, bounded by concentric rings of vesicles alternating with narrow red zones. This form of lesion constitutes *herpes iris*. Variations, however, in the mode of development of this lesion have been recorded by different observers. It appears to me that a ready explanation of this can be found in the fact that different skins often behave differently when subjected to the action of the same morbid process. Variation in anatomical structure, according to the location of the primary lesions and peculiar individual susceptibility, are chiefly responsible for these facts of common observation. The resulting lesion is the same, however, and its effect is so striking that when once seen it will never be forgotten. The clinical picture here portrayed constitutes a typical lesion of herpes iris, the primary papule being preceded usually by a sensation of tingling or itching. Evolution proceeds rather slowly, the patch reaching its maximum—a diameter of from a half to one inch—in about a week. Involution then begins, the color slowly fades, and the patch flattens by absorption of the exudation, disappearing entirely in about two weeks, leaving slight pigmentation. The backs of the hands, fingers, and wrists, and the elbows, ankles, and knees are the favorite sites for the eruption.

Although the foregoing is the course of an individual lesion of herpes iris, the process is generally much prolonged by the appearance of others at intervals of a few hours or days. These crops of efflorescences are usually symmetrical, though some, naturally, are less developed than others. In this manner the whole attack may last from two to six weeks. The majority of cases run this mild

course, but variations in the severity of the process may occur, and instead of remaining confined to the ordinary locations, the patches may enlarge and coalesce with others, covering large areas. In this manner the eruption has been known to affect the palms and soles and even to become more or less universal. In this severe form serious hæmaturia has occurred. Likewise there may be a great increase in the exudation, the central vesicle developing into a bulla which may become quite enormous by coalescence. Hemorrhages into this bulla may also occur.

With or without the trunk being involved, analogous lesions may appear on the mucous membranes, notably those of the buccal and pharyngeal cavities. In these cases the lips are swollen and covered with vesicles or blood crusts. The mucous membrane of the cheeks, lips, and tongue presents irregular raw-looking patches, outlined by the attached and ragged circumference of broken vesicles. The tongue may be greatly swollen and the uvula and soft palate may also be implicated. In rarer cases, the epiglottis and larynx are likewise involved. The affection is extremely painful, rendering it almost impossible to open the mouth or to eat, and the decomposing tissues produce a characteristic fetor. In the only case that I have seen where the mouth was severely affected in this manner, the condition simulated more closely the mouth affected with pemphigus vulgaris than anything I am familiar with. In rare cases the disease may involve the vulvovaginal mucous membrane, the urethra, and glans penis. Some cases have also been reported in which there are conjunctivitis and swelling with ecchymoses of the orbital connective tissue. As before stated, herpes iris generally occurs independently of the other lesions of erythema multiforme, but exceptionally its lesions may be mingled with them.

It must be understood that the various clinical manifestations here described are not often present in the same case. As remarked at the beginning, the process may stop at any stage in the course of evolution of a lesion and after a time undergo retrograde changes and cease altogether. Unquestionably the most common variety seen is *erythema papulatum* and the rarest *herpes iris*. The subjective symptoms in erythema multiforme are as a rule of little importance. The skin lesions are generally out of all proportion to the symptoms manifested; even in very angry-looking cases there is often only moderate itching or burning. In *erythema urticatum*, however, the itching is always a marked feature, and of a very intense character. Occasionally there is pain in the joints of the fingers and wrists, but it is never a severe symptom.

Course and Duration.

Erythema multiforme runs a benign course in the majority of cases; after a variable duration, with perhaps a longer or shorter series of relapses, it ends ultimately in complete recovery. The patches gradually disappear, they lose their bright color, and terminate in pigmentation without desquamation. In the vesicular forms, however, a considerable formation of crusts and subsequent desquamation result from the desiccation of the lesions. Likewise in the bullous forms, especially when hemorrhages occur into the bullæ, the lesions are liable to become purulent, resulting in ulceration and scarring. In children, when vesicles occur, they not infrequently become purulent and result in scars.

The duration of the disease is generally from two to six weeks, but it may last for much longer periods in exceptional cases owing to repeated recurrences of the eruption. These cases may well be classed as chronic, but each relapse runs the typical acute course. The great tendency to relapse is a peculiar and marked feature of the disease. Relapses may follow in close succession or there may be several in a year or an attack may occur at about the same time year after year. There is practically no limit to these and the disease may thereby be prolonged many years. Lewin[10] records three personal cases, in two of which the duration was six months, and in one it was one year. Kaposi has seen several cases in which for one, two, or more years there were constant relapses of erythema and herpes iris and circinatus. Hutchinson reports a case that lasted five years. Polotebnoff[11] gives the history of a hospital patient in whom the body was not free from efflorescences a single day for a period of fifteen years. All these, however, are exceptionally rare instances.

Complications.

Severe complications are occasionally associated with erythema multiforme, and for this reason the disease is often described as running a benign or a malignant course. This is an error, however, for in the so-called malignant cases the erythema is only symptomatic, and if a fatal termination ensues it must be attributed to the general disease and not to the erythema. The most frequent complications are endocarditis, pericarditis, gastro-intestinal disturbances, nephritis, meningitis, and pneumonia. Osler,[12] in an interesting article "On the Visceral Complications of Erythema Exudativum Multiforme," records eleven personal cases, in all of which there were severe gastro-intestinal crises, and in five there was acute nephritis. Most of the cases, however, would seem to belong more properly to purpura

or peliosis rheumatica, as hemorrhage was the most constant feature. Two of his cases had recurring gastro-intestinal crises without skin lesions.

Etiology.

Nothing very definite is known in regard to the cause or causes of erythema multiforme, although it is one of the more commonly observed affections of the skin. It develops under such varied influences and circumstances that it is quite impossible to formulate anything but hypotheses. It occurs more frequently in young adults than in older people, though no age is exempt. Females are more commonly affected than males and it most frequently occurs in the spring or fall of the year, April and November being the usual months. Previous attacks also predispose to others, and they are liable to recur at the same time of the year in each case. Climate is sometimes an influencing factor, for we frequently see the disease in immigrants who have recently landed. Sudden changes in temperature, especially when accompanied by chills from being overheated, as well as exposure to cold, intense solar heat, or salt winds may act as exciting factors. Diet seems to have but little influence in the production of the disease. Defective sanitation, especially with respect to drains, is said to be a predisposing cause. It has also been known to follow mental and moral shocks and severe nerve strain. It frequently occurs in anæmic and chlorotic women, and amenorrhœa and dysmenorrhœa may be mentioned as predisposing factors. It occurs reflexly from urethral erosions produced by instruments, or in the course of a gonorrhœa. Kaposi mentions a case in which erythema annulare developed on the backs of the hands at each relapse of a chronic gonorrhœa. The same observer states that mercurial inunction would repeatedly excite erythema iris in one of his patients. Rheumatism and gout bear some relation to the disease, for the eruption is frequently seen in these subjects or in those who give an antecedent history of these affections. Whether the cardiac affections sometimes complicating erythema multiforme are rheumatic in origin, is not known. The disease may likewise be symptomatic of some of the infectious diseases, such as variola, typhus or typhoid fever, etc. In many cases no possible cause can be found after the most careful observation.

Pathology.

Great latitude of opinion exists in regard to the pathology of erythema multiforme. It is variously considered as an infectious disease, as a distinct specific affection, or as an angioneurosis from vasomotor disturbance. Exponents of the infectious theory base

their conclusions on its close resemblance to the various infectious diseases, as regards its mode of inception, subsequent course, and complications, and its apparent epidemic character, from the occurrence of large numbers of cases at certain seasons, etc.; also from the close resemblance it bears to the abortive forms of certain infectious diseases, and to cases observed at the beginning and end of an epidemic; likewise from the discovery in the lesions and in the blood of bacterial elements thought to be the materies morbi of the process. Cordua and Luzzato independently found micrococci in the blood and lesions. Manssurow demonstrated bacilli and spores, and other observers have likewise described different forms of cocci found. The theory of its being an acute specific disease is founded on the frequent occurrence of prodromal symptoms accompanied by fever, on the definite course it appears to run in some instances, and on its occasional endemic character.

The angioneurotic theory, whose advocates are Lewin, Auspitz, and Schwimmer, is given credence to, as apparently affording the only plausible explanation of the changes that take place in the cutaneous blood-vessels, and the consequent morbid anatomy. This theory is clinically supported by the observance of cases of peripheral origin, due to local toxic influence or to trauma, and those of central origin acting either in an indirect reflex manner as, *e.g.*, in urethral erosions, gonorrhœa, disturbance of the female genital organs, etc.; or as direct auto-intoxications occurring in the course of a general or systemic affection. There is no question but that the mechanism is a capillary hyperæmia with subsequent paresis, facts both of clinical observation and of anatomical demonstration, as shown by the inflammatory effusion of fluid, leucocytes, and blood-coloring matter. How this is brought about it is difficult to explain, but it is certain that the mode of origin is different in different cases, and no theory will therefore apply to all examples of the disease.

Morbid Anatomy.

The morbid anatomy consists in a dilatation of the blood-vessels of the corium with cell effusion and exudation of serum into the cutis. The density of the cell effusion varies with the amount of serous exudation, the infiltration being most marked about the vessels; it may extend, however, to the bottom of the corium. Cell proliferation may also take place with thickening of the rete, and blood-coloring matter may stain the cells. The stratum corneum is unaffected, unless there are sloughing and ulceration. Vesicles and bullæ result from excessive exudation which lifts up the horny layer and a portion of the granular layer.

Diagnosis.

Little difficulty should be experienced in the matter of diagnosis. The main diagnostic features are its acute onset accompanied with slight constitutional disturbance, fever, articular pains, etc.; its short course with tendency to relapse at certain seasons of the year; the tendency of the lesions to appear in crops with symmetry and special localization; the multiform and changing character of the lesions which are often followed by pigmentation; the absence of scaling; and the mild character of the subjective symptoms in proportion to the extent of the eruption.

In *urticaria* the principal lesion is a wheal which develops quickly and not in successive stages. The skin is irritable, and similar lesions can often be produced by drawing the nail over it. The wheals are more or less uniform in size, generally white or pale red in color, and are evanescent, rarely remaining longer than a day, and disappear without pigmentation, as a rule. There is no tendency to symmetry, special localization, or seasonal recurrence. Constitutional symptoms are absent and there is intense itching. In many instances the attacks can be traced to irritating ingesta.

In *papular eczema* there are no constitutional symptoms, the papules are small and acuminate and do not enlarge by peripheral extension. They may be symmetrically arranged and occupy the same positions as erythema multiforme, but some of them develop into vesicles, which by coalescence form moist, crusted patches. The itching and burning are marked symptoms of papular eczema.

In *dermatitis herpetiformis* the lesions are generally multiform, but they display no symmetry and no definite localization. The disease runs a very chronic course, the relapses also being chronic and not acute, as in erythema multiforme. Constitutional symptoms are often present and the general nutrition may suffer. The subjective symptoms are intense itching or burning pain.

Tinea circinata, some forms of *psoriasis* and *seborrhœic eczema*, are distinguished from erythema annulare by their want of symmetry and the presence of scaling. *Syphilis* in a circinate form may simulate erythema annulare, but the firm, infiltrated border which does not disappear under pressure, together with other evidences of the disease which can generally be found, will serve to differentiate the lesions. *Herpes iris*, with its peculiar conformation of concentric rings of various colors surrounding a central lesion, cannot possibly be confounded with any other affection. *Erythema iris* simply differs from it in the absence of vesicles.

Prognosis.

This is almost invariably good; the disease usually runs a mild course and disappears in from two to six weeks. Slight pigmentation may remain for a short time, and in rare cases scarring may occur. Recurrences are almost sure to take place, and the prognosis should be guarded on that account. Deaths have been known to occur in connection with the disease, but only when the erythema is complicated with one or another of the serious affections before mentioned. Lewin has collected ten fatal cases out of a total of seventy. It is obvious, however, that as the erythema is only a symptomatic feature in such cases, the prognosis belongs to the accompanying disorder and not to it.

Treatment.

Erythema multiforme in the majority of cases runs a pretty definite course and gets well without much treatment. In many cases the cause cannot be ascertained and the disease can be treated only symptomatically. Every departure from health should be rectified and a natural performance of the bodily functions established, but routine treatment of any kind is not to be recommended. Certain cases exhibit a more or less debilitated condition, and tonics of iron, cod-liver oil, hypophosphites, quinine, and strychnine are serviceable. Iron is preferably used with a mild aperient, an advantage recognized by Crocker, and the value of which I can heartily indorse. I always use a modified Startin's mixture as follows:

℞ Ferri sulphatis, ... ʒ i.
Magnesii sulphatis, ... ʒ vi.
Acidi sulphurici diluti, ... ʒ iij.
Syrupi zingiberis, ... ʒ iv.
Aquæ, ... q.s. ad ℥ iij.
M. Sig. Teaspoonful in water through a tube after meals.

If the patient exhibits rheumatic tendencies the alkalies, acetate or citrate of potash in twenty-grain doses after meals, in a mixture with infusion of quassia are to be recommended. Arsenic in certain cases is of great value, but its use in an indiscriminate manner should be discouraged. Though very tempting in a disease which occurs so often in an idiopathic manner, its employment is generally useless or even harmful, and it always does harm when the inflammatory symptoms are marked. In *herpes iris* and in the bullous and vesicular varieties, however, it is of service. It is best given in the form of liquor sodii arseniatis, in doses of from five to fifteen drops every two or three

hours until an effect upon the disease is produced, or until the point of tolerance is reached, when the dose may be reduced.

Locally, the calamine and zinc lotion before mentioned, applied two or three times a day, is often all that is required. Zinc ointment, either alone or combined with three or four per cent. of ichthyol, is of great service when the epidermis is broken. Salicylic acid in two-per-cent. strength with zinc ointment base is also useful. Five-per-cent. white precipitate ointment has likewise proved serviceable in my hands. Where large or small areas are denuded from the rupture of bullæ, five to six per cent. of ichthyol in carron oil may be recommended.

Diet has but little effect upon the disease, though the inflammatory types are benefited by the avoidance of food of a stimulating character. Alcohol is generally harmful, is never necessary, and should therefore be forbidden.

Erythema Nodosum.

Synonyms.—Dermatitis contusiformis; Erythème noueux.

Symptoms.

The disease is usually ushered in with slight constitutional disturbance—general malaise, slight fever, coated tongue, and gastric symptoms—though frequently its onset is so acute that none of these symptoms occurs. The most constant symptom, and one which is rarely absent, is pain and swelling about the joints, especially those of the lower extremities, and pain and tenderness along the shin bones. After a variable period, usually a day or two, the eruption makes its appearance in the form of node-like swellings, most often situated along the fronts of the tibiæ and on the dorsa of the feet. This localization, however, is not absolute, the lesions appearing sometimes on the forearms and thighs and more rarely on the face and back, on the tongue, and on the mucous membrane of the mouth and pharynx. They generally appear where the skin is in close apposition to a bony surface or prominence. They are usually symmetrically distributed and come out in crops of two or three, but are seldom numerous, though exceptionally ten to fifteen may be observed. The swellings are round or oval—the long axis usually corresponding to the axis of the limb, and they vary in size from a walnut to a hen's egg. The nodules, even the largest of them, have no definite border, but merge gradually into the surrounding skin, some being so slightly elevated that they can be felt rather than seen. The swellings are tense and firm at first, somewhat painful of themselves and tender to

the touch, and of a bright-red color. They usually remain stationary for a day or two, then the bright redness begins to fade, changing to a dusky red or bluish color, and exhibiting in course the various shades of violet, blue, and greenish-yellow seen in a bruise. Coincident with the changes in color, the infiltration becomes less, the tumors soften even to the point of semi-fluctuation, though they never go on to suppuration, and then disappear, leaving only a brown pigmentation.

It takes a week or ten days for an individual nodule to go through these changes, but as new crops appear during the first week or two, the disease lasts on the average from three to six weeks. One attack of the disease predisposes to others, however, and the eruption may recur at the same season of the year for several years. The disease generally runs a benign course, but when it lasts several months, as it may exceptionally, the patient's health suffers. Malignant cases have been reported and death may occur as a result of complicating affections, the most usual one being an endocarditis.

Although erythema nodosum almost always occurs alone, it is sometimes associated with lesions of erythema multiforme. Coincident with the nodosities often seen on the lower legs, the papular or other lesions of erythema multiforme may occur on the hands, arms, or trunk. This is an extremely rare occurrence, but it serves to establish a relationship between the two diseases.

Etiology.

The disease rarely occurs in patients over thirty years of age, being most frequent in children and young adults. Females are more often affected than males, in about the proportion of two to one. Stephen Mackenzie found five females to one male in an analysis of one hundred and eight cases. It occurs more commonly in the spring or autumn, an indication that sudden changes in temperature act as exciting factors. It is also observed more frequently in debilitated and poorly nourished children, and in connection with chlorosis. Uffelmann and Oehme state that it is often a concomitant of tuberculosis, in which case grave results may follow. Crocker, however, failed to establish any relationship between the two diseases in connection with an examination of many thousand children. Numa Bès [13] has shown by numerous observations the connection of erythema nodosum with diseases of the genito-urinary organs—buboes, gonorrhœa, leucorrhœa, menstrual disturbances, and syphilis. Other complications, as malaria, pleurisy, pneumonia, endocarditis, etc., are observed, and that erythema nodosum is closely related to rheumatism there seems to be but little doubt. There is often evidence of ante-

cedent rheumatic troubles, though frequently rheumatic symptoms, arthritis, fever, sour sweats, etc., are manifested in the patients themselves. The possibility of the endocarditis which sometimes complicates the disease being of rheumatic origin should also be considered. In view of these facts Begbie, Mackenzie, and others defend very strongly the rheumatic origin of erythema nodosum. Vidal and Leloir are quoted by Elliot as being of the opinion that the eruption in these cases is erythema multiforme tuberculatum or urticaria, and not erythema nodosum, and that it is merely symptomatic of the systemic disease. This opinion may be correct when applied to certain of the complicating affections, but the fact that erythema nodosum is so frequently associated with rheumatism, or with the disorders before mentioned, all of which commonly occur as complications of rheumatism, and that the same treatment is effective in both conditions, affords sufficient proof in my mind of the relationship existing between them.

There occur, finally, many cases of erythema nodosum for which no cause can be found.

Pathology.

There are two views in regard to the pathology of erythema nodosum; some representatives of the French school of dermatology hold that it is an independent and specific disease, while the Vienna school and most English and American authors consider it as closely related to, if not a special variety of erythema multiforme. The latter view gains support, not only from the fact that the pathological findings are identical in the two affections—except for differences in development—but both occur idiopathically or as a result of the same causes, they display the same disposition to special localization, and they both run a fairly definite and typical course. Furthermore, the lesions of both have been found associated upon the same individual at the same time. I would consider erythema nodosum, therefore, to be a special clinical type or variety of erythema multiforme, like erythema annulare or herpes iris, and not an independent affection. The discrepancy in clinical features displayed by these various types may be attributed, in a measure perhaps, as Crocker suggests, to differences in location of the lesions, whether they are situated over bony surfaces or in the soft parts; but there must be other unknown determining influences, inasmuch as herpes iris, a wide variation from this type, occurs also most frequently over bony surfaces.

Morbid Anatomy.

In a nodule of erythema nodosum there are a diffuse serous exudation implicating all the layers of the cutis, a dilatation of the lymph

spaces and capillaries, and an infiltration due to cell effusion and immigration of red blood corpuscles. The cells may be blood stained, and hemorrhage into the cutis occurs.

Diagnosis.

This is seldom difficult. The sudden occurrence in crops of tender, painful nodes, along the fronts of the tibiæ, symmetrically arranged and displaying the colors of a bruise in their recrudescence, are features not easily mistaken, especially when accompanied, as they usually are, with articular pains. Non-ulcerating nodes of *syphilis*, occurring on the lower extremities in the late stage of the disease, may simulate the lesions of erythema nodosum, but they develop very slowly and are extremely hard at first, though not very tender; they do not come out in crops, and are not symmetrical; they become red only after a time, and have a definite well-defined outline. Other evidences of syphilis can also usually be found. In the rare cases in which there is a symmetrical development of nodes in the early stage of the disease, the infection is a severe one and other marked evidences of syphilis will be present. *Erythema induratum* (*Érythème induré des scrofuleux*) can be distinguished by its long course, the absence of articular pains or febrile disturbance, the absence of pain in the lesions, the want of symmetry in their localization, and their occurrence in small numbers. Their tendency to necrosis and ulceration is likewise a distinguishing feature. When erythema nodosum develops in other localities than on the extremities, the diagnosis is often very difficult, but a careful study of the mode of development and course of the lesions, remembering at the same time their inclination to relapse, will soon remove all doubts.

Prognosis.

The prognosis in the majority of cases is perfectly good, the patients often recover without treatment, when the disease has run its course. The tendency of the affection to relapse must not be forgotten, however. Some patients are more ill than others, necessitating confinement in bed; the nutrition suffers in these instances and recovery may be slow. If complications arise in the course of the affection, particularly renal or cardiac disease, the prognosis is serious, for a fatal termination is liable to occur.

Treatment.

Internal.—A light diet should be ordered and the natural functions are to be regulated. According to the indications, iron, quinine, ergotin, and alkaline mixtures should be employed. The modified

Startin's aperient mixture, mentioned in connection with erythema multiforme, is of service in a large proportion of the cases. The citrate or acetate of potash in fifteen- to twenty-grain doses, three times a day, or salicylate of soda, ten to fifteen grains three or four times a day, are effective, especially when there is a rheumatic element present. Each case must be treated on its merits, as a general thing, no special line of treatment being applicable to all cases.

Local.—Rest in the recumbent position, with elevation of the legs, is a necessary adjunct. If this cannot be obtained, a Martin rubber bandage is the best substitute. Liquor plumbi subacetatis, ʒ ss.; aquæ, ℥ i., applied warm, or a ten-per-cent. watery solution of ichthyol is usually all that is required in the way of local medication. Under no circumstances should the nodules be opened, for no matter how soft they may become, they always disappear without ulceration.

Erythema Induratum.

Synonym.—Érythème induré des scrofuleux (Bazin).

Until recently this affection received but little attention from dermatologists, though Bazin described it under the above title as early as 1860. The disease is confined to the lower legs of girls or young women of a lymphatic or strumous constitution, and is mainly the result of fatigue or long standing; saleswomen, washerwomen, etc., are accordingly most liable to it. Exceptionally boys and older women may be affected (Crocker). It occurs usually in the winter season, and in those with habitually cold hands and feet. The onset is generally acute but without febrile disturbance or constitutional symptoms. It is characterized by ill-defined patches of infiltration of a bright-red color, slowly becoming violet, or of nodules either superficially or deeply seated in the cutis. Observations are not as yet uniform in regard to the appearance and behavior of these lesions. Crocker states that there may be many of them, either nodules or plaques, varying in size from a quarter of an inch to an inch or more, red at first, and afterwards of a livid hue, or showing no change of color. These may coalesce into large, brawny infiltrations, and, according to this observer, affect usually the calf of the leg or just below it.

Bazin, on the other hand, in his description speaks of it as occuring in a single plaque, more frequently situated upon the fronts or outer surfaces of the legs. A marked feature is the indolent character of the indurations, which are generally not painful or tender and which run a very long course with a liability to relapse. They may disappear by slow absorption, or necrosis and ulceration may occur, the result-

ing ulcer being very indolent in character. From my limited experience, having seen but one or two cases in hospital practice, I should be inclined to believe their most common method of termination is in necrosis and ulceration.

Diagnosis.

The disease may resemble very closely *Erythema nodosum*, but this latter affection is characterized by an acute and comparatively short course; by the occurrence of articular pains with a slight febrile disturbance; pain and tenderness in the lesions; their symmetrical arrangement and multiplicity; and finally, by their lack of tendency to ulceration. *Syphilis* as a late gummatous formation often simulates this condition very closely, but a gumma is slow in evolution, it remains but a comparatively short time before it breaks down, and the resulting ulcer presents an abrupt sharply cut edge. There likewise would be evidence of past ulcerations or other syphilitic manifestations in most cases. In case of doubt active antisyphilitic treatment would soon decide the matter.

Treatment.

These patients are generally badly nourished and of a lymphatic type. Every effort should therefore be made to improve their nutrition by a wholesome and nourishing diet, proper hygienic measures, and general tonics, such as cod-liver oil, iron, phosphates, quinine, etc. Prolonged rest with the legs elevated should be enjoined, and to avoid recurrence of the trouble a change of occupation may be necessary. With the very best treatment the disease generally proves very intractable.

PELIOSIS RHEUMATICA (Schönlein).

Synonym.—Purpura rheumatica.

Peliosis rheumatica is generally considered as a variety of purpura and is included, therefore, in most text-books of dermatology in a separate class, namely, that of "hemorrhagic affections." The disease is so closely allied, however, to the exudative processes we have just considered, that I have thought it best to follow Crocker and Kaposi in giving it a place among the erythematous affections of the skin. It differs from erythema multiforme and erythema nodosum in that the accompanying articular pains are more pronounced and the hemorrhages are a constant feature and not an occasional one. They all exhibit the same typical primary localization, run practically the same course, have nearly the same symptoms and complications, are pathologically the same, and are due to the same causes.

Definition.

An acute disease, characterized by pain and tenderness in the joints, and accompanied by an eruption of hemorrhagic papules and raised patches, usually confined to the extremities.

Symptoms.

The disease is preceded by slight constitutional disturbance, general malaise, anorexia, sleeplessness, etc., accompanied by pains of a mild character referred to the joints, especially those of the knee and ankle; the wrists and elbows are less frequently affected. There is usually some swelling and tenderness about the affected joints, but these symptoms may be absent. There is generally, though not always, a slight febrile disturbance, about 101° or 102° F., but this bears no relation to the severity of the inflammatory phenomena. After a variable period of from one to three days the eruption appears, coincident with which the pains ordinarily subside; this is particularly true if the attack is to be a mild one. The eruption is practically confined to the extremities and displays similarity in localization to that of erythema multiforme, the lesions occurring in greater abundance, however, in many instances, in the neighborhood of the inflamed joints. The eruption appears very rarely upon the trunk, but when it does it is generally an extension of that on the extremities. In this manner a few scattered lesions may rarely be found on the lower part of the abdomen and back, having extended up the thighs and over the buttocks. In some cases the lesions appear on the mucous membrane of the mouth and pharynx.

The lesions occur in the form of papules and slightly raised patches, of a bright-red color at first, but slowly becoming livid or bluish-red; or they may be purpuric primarily and not elevated. They vary in size from a mere point to that of a split pea or larger, and are characterized by their permanency under pressure with the finger. After remaining for two or three days, absorption gradually takes place, the lesions displaying the usual variations in color seen in a bruise. A single attack will last in this way a week or ten days; and this may be the end of it, but more commonly the disease is prolonged from three to six weeks by successive relapses. The same or different joints may be affected in the subsequent attacks, which run the same course, accompanied by malaise, pains, fever, etc. Exceptionally the disease may last in this way months or even years. Sometimes peliosis rheumatica takes on the clinical characters of erythema multiforme, or it may be observed associated with the various lesions of that disease, *e.g.*, with erythema papulatum, annulare,

nodosum, herpes iris, etc. Crocker gives a case in point, of purpuric erythema multiforme in a girl of twelve years presenting a bright-red papular eruption on the extensor surfaces of the limbs, which was unaltered by pressure. Two of the lesions consisted of two concentric circles, and irregular vesicles and hemorrhagic bullæ likewise occurred on the ankles.

Complications.

This disease may develop into purpura hæmorrhagica, though this is an extremely rare complication. Hemorrhage from the palatal mucous membrane resulting in destruction and gangrene of the velum, with an ultimate fatal termination, is recorded in a single instance by Kaposi. Periodical hæmaturia, albuminuria, endocarditis (Oliver, two fatal cases), and temporary or permanent valvular insufficiency, may be mentioned as complications. A gradual development of aortic insufficiency was observed in two of Kaposi's cases. The same observer has noted chronic nephritis, alone or complicated with cardiac disease, associated with those cases that last for years by repeated relapses. The complications of this disease are generally more serious than those occurring in the course of erythema multiforme or erythema nodosum.

Etiology.

The cause is often obscure. The disease occurs more frequently in females than in males and is most common between twenty and thirty years of age, although children may also be affected. It is likewise more common in the spring and fall of the year. Rheumatism is generally mentioned as a cause of the affection and rheumatic subjects or those having had attacks of rheumatic fever are particularly predisposed to it. The cardiac complications may possibly be referred to this etiological source. As exciting factors, chills, malarial poisoning, and exposure to the damp of cellars have been mentioned. In many cases no definite cause can be ascertained.

Pathology.

A lesion of peliosis rheumatica shows the same morbid changes that we have studied in connection with erythema exudativum multiforme. The processes differ, however, in that hemorrhages in this instance are a constant feature instead of an occasional one, as in other forms of erythema. On the other hand, exudation may not always accompany the lesions of peliosis rheumatica, for purpuric spots may occur as the primary lesion, a sudden hemorrhage taking place before exudation has begun. It is difficult to tell how these

changes are produced, for they may be manifestly different in different instances. That they are due to the influence of the nervous system in some cases there seems to be no question. Changes in the calibre of the vessels, a contraction, or a dilatation, resulting from passive hyperæmia and subsequent paresis, may cause a rupture of their walls. The nutrition of the vessel walls may likewise be affected through nervous influence, whereby extravasation or rupture may take place. Furthermore, destruction of the sympathetic ganglion in the frog has resulted in hemorrhages in the hind legs. For these and other reasons the disease is generally regarded as an angioneurosis and by some as a trophoneurosis. This theory, however, does not hold for all cases. In certain instances rupture may follow from alteration in the blood pressure as the result of emboli or thrombi, occurring in various ways; an ordinary blood clot, masses of fibrin, or colonies of micro-organisms are sources that may be mentioned. In purpura hæmorrhagica, Letzerisch has demonstrated a bacillus; other forms of bacteria and also micrococci have been found by other observers. It is evident, therefore, that in the present state of our knowledge no plausible explanation of these phenomena can be given which will apply to all cases.

Diagnosis.

It would be difficult to mistake this eruption for anything else. The occurrence of purpuric spots in the localities mentioned, accompanied by slight constitutional disturbance, articular pains, and swelling of the joints, are distinctive features of peliosis rheumatica. Purpuric lesions can always be distinguished from the fact that pressure with the finger will not remove the color or cause it to fade.

Prognosis.

In an uncomplicated case the prognosis is always favorable, though no definite information can be given in regard to the duration of the disease. Relapses are to be expected and the number and frequency of them can never be foretold. When complications occur the prognosis must be based upon them. One must not lose sight of the fact also that a serious purpura hæmorrhagica has developed in the course of this disease.

Treatment.

It is important in all cases to put the patient to bed and place him on a liberal diet. Rest should be enjoined until the disease abates, for frequently relapses occur from getting up too soon. Salicylate of soda, in doses of fifteen grains three or four times a day, is effective in

relieving the pains. Iron, quinine, and general tonics are useful in the general course of the disease. A five-grain ergotin pill every two or three hours, at first, will generally control the hemorrhages. Turpentine is used by some for the same purpose. Sedative local measures and cold compresses may sometimes be required.

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ECZEMA AND DERMATITIS.

BY

JAMES NEVINS HYDE,

CHICAGO.

ECZEMA AND DERMATITIS.

ECZEMA.

Synonyms.—Ger., Eczem, Salzfluss; Fr., Eczème, eczéma. (Vernacular: "Salt rheum," "wet tetter.")

Definition.—Eczema (from ἐκζέω, to boil out) is an inflammatory dermatosis, characterized by a remarkable multiformity of cutaneous lesions, including macules, papules, vesicles, pustules, scales, and crusts; and often by a catarrhal discharge from the affected surface, accompanied by intense itching, and occurring in both acute and chronic type.

Etiology.

Eczema, though not the most frequent of occurrence of all disorders of the skin, is without question that with which the practitioner is most often confronted. It represents in its several forms statistically from one-third to somewhat less than one-half of all cutaneous affections.

The causes of eczema are both external and internal, the former decidedly preponderating in frequency and efficiency. Among external causes may be named contact with any of the irritants of the skin, including thermal variations (heat, artificial, solar; cold, as after exposure to frost and ice), mechanical irritation (friction, pressure, superficial traumatism), chemical substances (acids, alkalies, caustics, mucuna pruriens, poison ivy, dyes, etc.), and the animal and vegetable parasites which thrive on the body surface. Among the irritants of the class last named may be mentioned the mucors and micro-organisms which have been demonstrated as efficient factors in the production of lesions of the skin.

Many of these causes operate conjointly. This combined action is best illustrated in the trades, where, for example, a workman in tiles will subject his hand to the action of cold in the water from which the tiles are taken and at the same time suffer from the effect of friction. In a similar way the dyer will be injured by the poisonous action of the dyes brought into contact with the skin, and also from the exposures required to do his work. Many forms of derma-

titis thus awakened disappear so rapidly on the removal of the cause that it is not always proper to assign them to the category of the eczemas; an enormous number, however, exhibit symptoms which cannot in any way be differentiated from the accepted types of eczema.

One of the most fruitful sources of eczema is scratching. This is the chief aggravating cause of many of the obstinate forms of the disease; but it is also the sole factor in some instances. There is usually at the outset a mild or severe pruritic condition, originating from various causes, which it is sought to relieve by scratching. The habitually scratched skin is usually an eczematous skin; and the habit of systematically scratching the exposed integument in certain individuals is capable of prolonging an eczema for a series of years.

Eczema is in many cases produced by causes which are commonly described as of internal origin, and yet which can be classed only indirectly in that category. In this way a series of causes originating outside of the body excite or aggravate eczema by their indirect action upon the skin. Here may be named a number of medicinal, dietetic, and toxic agents operating after ingestion, and beverages, especially those that are alcoholic.

Many internal causes have been cited as operative in eczema; some with good reason, others where there is doubt as to the efficiency of the alleged cause. Thus, for example, the physiological crises of the human economy have all been named (*e.g.*, the period of teething, of puberty, of the menopause, etc.), and of them it may be said that while the disturbance of the system at these periods may operate to excite or retard recovery from eczematous attacks, it is certain that the majority of mankind pass through these crises without suffering from the disease under consideration.

No one, however, can doubt for a moment that many visceral disorders (of the liver, of the spleen, of the uterus, of the lungs, etc.) have an influence upon the production of eczema, repeated attacks even following accesses of morbid affections of these organs; and it is equally certain that many varieties of eczema are directly dependent upon several systemic states such as, most effective in the list, gout and rheumatic gout, dyspepsia, constipation, and scrofula.

By those who adhere still to the rapidly decadent teachings of the French school on this subject, it is believed that there is a species of systemic dyscrasia, or vice, as a result of which chiefly, eczema and a few other cutaneous affections develop. The old classification of such dermatoses into "dartres," as due to a dartrous or arthritic diathesis, was founded on practically the same belief as that which among the older English writers gave to the world such names as

"tetter," "rheum," and "humor of the blood." The doctrines which were illustrated by these and other phrases have been undermined by the revelations of modern bacteriology, with the result that less and less is heard each year of the practice which naturally sprang from these and similar views.

It must, however, be admitted by every candid student of the wide field here presented that it has not yet been exhaustively explored. There are cases of eczema the causes of which are obscure, others in which not even the wisest may be sure of the etiology. There are individuals who after repeated and prolonged exposure, without consequences, to all the causes here enumerated, develop suddenly an eczema which rapidly passes to the severest grades. There are other persons who suffer repeatedly on slight exposure to any one of several of the accepted causes. Again, it is obvious that the majority of all men, women, and children exposed repeatedly to every cause of the disease here named suffer at no time in their lives. With this in view it is further to be remembered that eczema attacks men and women of all ages, and children in all periods of development. No child, however, is brought into the world the victim of eczema. The argument here presented against a systemic state capable of producing the disease, is certainly strong. Children are born into the world suffering from syphilis, from variola, from congenital deformities, from nervous disorders, and from other affections. Infants also suffer from eczema in the severest forms within a brief time after birth. But none is eczematous before birth so long as the fœtus is safely immersed in its pre-natal bath of amniotic fluid and duly anointed with the vernix caseosa which perfectly protects the tender skin.

The alternations occasionally noticed between eczema and asthma, the one being aggravated when the other is relieved wholly or in part, have been noted by many observers. Genital eczemas occurring in connection with glycosuria may be due to the extrusion of a diabetic urine and its contact with external parts, or to centric irritation of the nerves of the affected region. As a rule this group of eczemas disappear readily when the sugar no longer burdens the urine.

Gout is not rarely the cause of an eczematous attack. This is especially true in the case of middle-aged men and women of full habit of body, where an obstinate anal or other eczema is due solely to the systemic state.

Neurasthenia, so commonly seen in overworked and anxious patients, especially in the large cities, may at times lay the foundation of an eczema by inducing a weakened or less resisting condition

of the integument. In infants, it is scarcely necessary to add, digestive disturbances due to improper feeding are fruitful sources of a lowered state of vitality of the skin and conduce certainly to eczematous attacks.

The more carefully one studies the causes of eczema the more clearly it is seen that no single etiological factor is responsible for any given attack. The multiformity of the disease at any given epoch and the remarkable changes which from one hour to another a patch of disease may exhibit, point with clearness to the fact that frequently shifting combinations of causes suffice to produce the result. There is no one cause capable of producing an eczema of variable type; and most eczemas are such. It is the combinations changing from moment to moment which are chiefly effective. This is abundantly demonstrated not merely by observation of the disease, but by a careful scrutiny of the most efficient of the agents recognized as having therapeutic value in its treatment. In no one case can it be decided in advance whether the treatment indicated and pursued on such indications will be certainly effective; the reason for this is that the varying group of causes in some cases elude even the most careful scrutiny of the practitioner.

Pathology.

The catarrhal character of the inflammation of the skin to which the word eczema is given by most modern writers, is generally admitted. The ultimate causes of this catarrhal inflammation, outside of the etiological factor which immediately excites it, are but little understood. If, with some of the later authors, it be believed that these catarrhal inflammations of the skin are induced wholly by the action of micro-organisms upon the surface playing the part of noxious parasites, many difficulties in reaching a knowledge of this part of the subject are removed. Unfortunately, however, the position that all eczemata are of parasitic origin is both indefensible in theory and dangerous in practice. A large number of micro-organisms can always be recognized upon an eczematous surface. This is so obvious as not to require demonstration. That with these germs may be combined such important etiological factors as the vegetable and animal parasites also must be admitted; but the fact is incontestable that no one micro-organism or parasite yet has been recognized as of itself capable of exciting an eczematous attack.

Changes suggesting that the nerves supplying a patch of eczematous disease are involved in some inflammatory process have been observed in a few cases. In yet others the skin which long has been

the seat of an eczema has been seen to undergo a thickening analogous to the fibrosis of certain of the viscera after their involvement in a neoplastic process. It can only be set down with certainty at the present time that the eczematous skin exhibits more or less constantly the several results of inflammation (infiltration, exudation, and at times superficial degeneration of the products of the inflammatory process).

The anatomy of the eczematous skin has been studied by a number of German, English, and American dermatologists with the result of discovering that the inflammation of the area attacked is at times confined to the appendages of the skin (pilary and sebaceous follicles) and at other times involves the interfollicular structure. In acute forms the vessels of the derma are increased both in volume and number, and furnish a serous exudate which distends the intercellular spaces; which is absorbed both by the cells of the corium and of the epidermis; and which ruptures the thorns of the prickle cells so as to produce in the lower part of the rete a chamber where the serum is accumulated in small collections (vesicles). In cases where a greater period of time elapses the cells multiply both in the corium and in the lower portions of the epidermis, and a fine reticulum of juicy cells is thus furnished stretching from the upper portion of the corium to the lower portion of the rete, probably along the lines furnished by the threads connecting the living matter of these two organs.

Many of the cells both in the middle and in the lower portion of the epidermis and in the upper portion of the derma, are not only swollen and stretched but torn; and their contents, added to the serum furnished by the multiplying and enlarged vessels, supply the abundant limpid or straw-colored gummy secretion occurring in acute eczema. When pus is furnished staphylococci are invariably present and responsible for the admixture of pus in the discharge. The presence of these micro-organisms further has a decided tendency to increase the severity of the process (greater infiltration, more abundant discharge, greater obstinacy with respect to the induction of involution). Where the exudation is slight or only apparent beneath an unbroken horny layer (papular eczema, erythematous eczema) there is simply a small amount of fluid furnished from below and a correspondingly denser proliferation of small cells.

The morbid anatomy of chronic eczema represents a continuance of the processes described above and their extension to a deeper tissue. The emigration of cells from the derma to the epidermis has proceeded for so long a period that the boundaries between these two divisions of the skin are confused; the normal elements of both are

separated by the outwandered and new-formed cells; the horny layer is removed at one or more points or quite extensively over large areas where the epidermal catarrh has been in progress; the papillæ of the corium are enlarged, and in rare cases they are flattened or atrophied; and the thickening of the skin due to the infiltration may produce a condition in which the volume of the integument is two or three times greater than that which is normal, and the thickening may even involve the panniculus adiposus.

Symptoms.

There are four elementary types of eczema, which if not often found in their purity, being frequently commingled, it is well to study at the outset as independent forms of the disease. The analysis of the symptoms thus fixed in the mind of the observer is of great advantage in the later study of the complex phenomena of the disease. The four primary types which may be recognized are the erythematous, the papular, the vesicular, and the pustular. The forms of eczema which may be said to be secondary rather than primary and which will be separately considered in this chapter, are eczema squamosum, eczema rubrum (or madidans), eczema parasiticum, eczema seborrhœicum, and the acute and chronic forms of the disease.

Eczema Erythematosum.

This type of eczema is best recognized on the face of elderly persons of both sexes, where it occurs commonly as a chronic disorder with acute and subacute manifestations. It is, however, often seen in other regions of the body, and in children as well as adults.

Erythematous eczema is characterized by the production of a diffuse, infiltrated patch of a light or dull and dusky red hue, the difference being due in part to the grade of inflammation present and to the characteristic color of the patient's skin. There is no moisture or discharge, little if any scaling until the disease has passed its apogee, and scarcely any crusting. At times, however, when the skin is well rubbed or scratched, as is often the case, a linen handkerchief applied to the surface will be moistened and stiffened by the serous ooze. In yet other cases when the oozing is somewhat more abundant, exceedingly minute vesicles can be detected upon the surface.

The itching is commonly severe, though scarcely as intolerable as in the papular type of the disease. Patients suffering from erythematous eczema of the face commonly point to the root of the nose and the lower portion of the brow as regions of great distress. In long-standing cases it is not rare to find the outer portions of the

eyebrows rubbed off in the effort to secure relief by scratching, and even furrows upon the cheek due to a similar cause.

Erythematous eczema is in a large number of instances confounded with erysipelas and treated as such. It is usually, though not invariably, developed symmetrically; and when occurring upon the face in a subacute form is frequently complicated by such a tumefaction of the lids as to obscure vision. Characteristic sequelæ of this process before complete involution has occurred, are flabby-looking pouches or bags of tissue pendant from the border of the lower lids.

Eczema Papulosum.

This is one of the most common, the most chronic, and the most annoying of the different types of eczema here considered. It is characterized by the occurrence of discrete, confluent, irregularly arranged papules, each always of a small size, none much larger than the head of a small pin. These lesions are of the smallest found in diseases of the skin with the exception of those seen in lichen planus. The eczematous papules are usually of a dull red, though occasionally of a vivid hue, and occur chiefly in those regions of the body where the fluid-producing eczemata are less likely to occur on account of a thick epidermis (extensor aspects of the limbs; back of the trunk and neck; the buttocks, etc.). For the same reason papules of this character are more often seen in adult years than in infancy. The papules in consequence of the excessive degree of itching which they excite are often wounded at the apex by rubbing and scratching, in which event minute specks of dry blood are commonly visible at the apex of each. When uninjured they may be recognized as having conical apices, though they may be flattened when two surfaces of the integument are in natural apposition. When patches thus formed are by any cause changed in type, the other clinical aspects of eczema are rapidly produced, such as those seen in a weeping or discharging surface, or as in the condition known as eczema rubrum. The combination of patches of papular eczema with those of an erythematous type, and even in acute cases with those of vesicular type, is by no means rare. It was due to the shrewd observation of Hebra and the experiments made by him that both papular and erythematous eczema were firmly established as phases of a single disease. Each form, however, without difficulty may be converted into the other, and each furthermore may be changed into any one of the varieties to be described later.

It would be difficult to enumerate in this connection the several names which have been given in the past to the various manifestations of papular eczema. For most of them the title has been some

impetigo scabida, impetigo figurata, etc. These terms are now obsolete. The only recognition of pustular eczema justified by the later knowledge of this subject is that which regards it as a coccogenous inflammation complicating the eczematous process.

Eczema Squamosum.

This represents rather a secondary than a primary phase of eczema in which the involved skin is covered with scales. The scales when typical of the disease are never bulky, voluminous, greatly elevated above the surface, nor characteristically white in hue either in the direction of the mother-of-pearl or of the silver-white tints. The squamæ are usually small and rest upon an infiltrated patch showing some redness beneath the scale formation. As a rule the patches of eczema are ill-defined; the purely squamous types of this disease, however, are more often distinctly outlined than are others. The patch is usually the seat of more or less itching and is sometimes well scratched; the ooze from the resulting fissures usually desiccating into light crusts which are mingled with the scales. Favorite sites of squamous eczema are the back of the neck, the outer faces of the extremities, and the covered portions of the body. Many cases described as instances of squamous eczema are without question illustrations of the parasitic forms of the disease described later in these pages.

Eczema Seborrhœicum.

The morbid conditions to which this name has been given have been observed since eczema was first studied by scientists, but lately have been brought into prominence by the careful studies of Unna, of Hamburg. This variety of the disease might perhaps be better designated by the title, eczema parasiticum. There are, however, certain special features of this form of eczema which justify its separate consideration. The term properly designates a condition in which there are present symptoms of both eczema and of what has long been termed seborrhœa. The conditions to which the name is properly applied vary in their clinical aspects to such a degree as certainly to justify the title of eczema which has been given them.

Seborrhœic eczema usually is first noticed in the region either of the temple or of the ear, on one or both sides. It is characterized by the development of a well or ill-defined patch which may be of the size of a large coin or larger, with circular outlines, or it may be compounded of small disks separated from each other by an apparently sound integument. Most often the disease begins in the scalp and spreads thence downwards over the ear, the side of the cheek, and the eyelids,

the integument above and below the clavicle, the axillary spaces, and other regions as far as the groins. The patches when in complete evolution are covered with a greasy scale usually not bulky nor thick, and from beneath which there may be furnished a fatty and serous discharge. Upon the scalp the hairs are usually thinned as in the seborrhœic affections of the scalp in general. The scales lie between the dry, harsh hairs of the scalp, precisely as they cover for example the surface of the adjacent ear. In the neighborhood of this organ the disease usually spreads back of the pinna, and not rarely a longitudinal and shallow fissure can be discovered behind the ear marking the line of its attachment to the surface of the head. Still further in a posterior direction, either in a single patch or in several disks, the disease extends, often with a fairly defined outline, in arcs of circles spreading from the ear as a centre. The itching varies in grade, but is rarely so severe as in the aggravated forms of papular eczema. As a consequence, the surface of the skin affected with seborrhœic eczema is rarely wounded by scratching as in other types of the disease. Variations, further, from the eczema type may be recognized in the loss of hair which results when the hairy regions are affected, the scalp particularly; in the occasional occurrence of dried masses of scales concrete and forming isolated heaps upon the affected surface; and in large papules which may develop upon the face. In extreme variations from the types here described seborrhœic eczema departs boldly from the grade of inflammation of the skin and betrays the symptoms of the disorders of the sebaceous glands, as, for example, when large fatty crusts are formed in those regions of the body where the sebaceous glands are largest and most frequently involved in functional disturbance. This variation from the other types of eczema is distinguished not merely by its clinical symptoms, but by the striking fact that it is more amenable to antiparasitic treatment than are the other forms of the disease.

Eczema Rubrum, or Madidans.

This is a clinical variation from one or more of the types already studied, and is usually the result either of improper treatment of the disease or of its misbehavior in consequence of the habits and occupation of the patient. When it occurs, the site of the inflammation exhibits unmistakable symptoms of aggravation by the assumption of a more or less vivid and angry color, by an exceedingly free discharge of serum, or of a sero-purulent exudate from the affected part; by obvious wounds of the surface through which the ooze escapes, and as a consequence by the formation of rather voluminous crusts produced by the desiccation of the exuded fluid. This clinical

picture is, as explained by its etiology, most often seen on the lower limbs, where the force of gravity has been effective in producing a turgidity of the vessels and tissues. It is often seen in the aged inmates of public charities, in whose cases prolonged labor in the erect posture on the feet and the application of irritating liniments and ointments have operated disastrously. The phenomena in these cases are always curiously commingled. Bright-red patches, surfaces covered with crusts, others partly healed, and yet others visibly pouring out a copious yellowish serum, make up together a field which involves the greater part of a leg or of an arm. The infiltration is usually well marked; the inflammation is the source not merely of itching, but of decided pain, and there is general soreness of the limb, furnishing one of the most distressing of the symptoms present.

Eczema Parasiticum.

There are not wanting modern observers who claim that all forms of eczema are parasitic and that the only efficient treatment of the disease is based upon that assumption. While there can be no doubt of the fact that some forms of eczema are due to the presence of both animal and vegetable parasites, it should be remembered that no single parasite has yet been recognized as present in all forms of the disease and as capable of inducing eczema when intentionally transmitted from one individual to another. Of the parasitic forms of eczema, it may be said in general that they are as a rule characterized first by the occurrence of the disease in distinctly outlined patches. Second, that in a more or less feeble degree they seem capable of spreading over the surface of the one body as the result of contact of contiguous or apposed surfaces; and third, that they exhibit in an equally feeble measure a transmissibility from one individual to another.

One form of parasitic eczema has been already described under the title of eczema seborrhœicum, with respect to which it may be remarked that while several mucors and other germs have been recognized upon affected patches, no one micro-organism has yet been isolated and demonstrated to be its effective cause. While this is true the brilliant success of the antiparasitic treatment of the disease would alone point conclusively to its parasitic origin. In general it may be set down that well-defined patches of eczematous disease, especially of erythematous and squamous type, will often be found to be the seat of numerous micro-organisms more or less directly effective in its production and will further be promptly relieved by antiparasitic treatment.

It would be improper to describe parasitic forms of eczema with-

out including those due to the animal parasites. Scratching is a fruitful source of the disease, and never more fruitful than when the itching which the scratching of the skin seeks to relieve is produced by the parasites of animal origin. Among these parasites may be named the pediculi, but of chief importance in this connection is the acarus scabiei. Scabies is a multiform eczema produced by the parasite effective in that disease. Whether the lesions exist solely upon the hands or elsewhere upon the body (axillary spaces, inguinal regions, breasts of women, buttocks, insteps), the pustules, vesicles, crusts, and other symptoms of the disorder are ever those which are exhibited in other types of eczematous disease. In no respect do the symptoms of scabies differ from those of eczema save in the localization of the disease, in the multiformity of the symptoms present at one time upon the surface, and in the few special features solely related to the channels dug in the skin by the female of the parasite. Here the traumatisms produced by scratching complicate the picture as it is presented, not merely in this but in other parasitic forms of eczema. The excessive itching of scabies has given the special name to that disease which it bears in more languages than one, and which stamps it as belonging to the category of the eczemata, even though the sensations are in part produced by the incursions of the parasite.

Eczema Marginatum.

This is a title which even in the time of Hebra was given to an eczematous patch characterized by distinctness of outline and a circinate configuration, spreading to a variable distance from such centres as the fork of the thighs, the umbilicus, and the axillary spaces. The disease extends from these centres peripherally with an advancing border which is usually elevated and scaly, the invaded areas being commonly infiltrated and scaling or simply exhibiting an erythematous aspect. Eczema marginatum is oftenest due to the presence of the trichophyton, the disease being an odd admixture of eczema and ringworm of the body. Other patches of marginate eczema are, however, due not solely to the trichophyton, but to other vegetable parasites present (microsporon minutissimum, etc.).

Eczema Neuroticum, or Neuriticum.

These terms have been applied to patches of eczema which limit themselves to the defined areas supplied by certain cutaneous nerves, the last title being supposed to represent a condition in which the nerve supplying the part, whether in cylinder or sheath, has been affected with inflammation. In these cases the patch of disease, cor-

responding strictly to the area of distribution of cutaneous nerves, is usually distinctly defined, infiltrated, and reddened in various shades. There is more or less itching present and the type is that of erythematous or papular eczema. By the French particularly, it is preferred to describe these patches as those of neurotic dermatitis. Some of them are apparently of reflex origin; others are more or less distinctly traceable to an effect produced upon the nerves by traumatism, pressure, etc. Illustrations of this are furnished by the symmetrical patches often seen on the cheeks of infants who are teething.

Eczema Diabeticorum (Fr. *Diabétides*).

Well-marked symptoms of eczema occur in the genital region of both sexes as a consequence of the excretion of sugar in the urine. In some instances these patients are diabetic and the relief of the local manifestations of the disease is secured before the disappearance of the glycosuria. In other instances, however, the local symptoms are severe and the glycosuria is temporary, the whole yielding to a proper dietary and appropriate treatment of the eczematous symptoms. In these instances the local phenomena in both sexes are tumefaction, redness, and at times a serous exudation from the affected region. The itching is usually of a severe type, and the scratching of the skin practised to relieve this symptom often complicates the disease to a serious degree. Occasionally large-sized papules, and even nodules, result from these efforts to relieve the pruritus. In some cases the torula cerevisiæ has been recognized upon the surface of the skin. It is generally believed that the presence of sugar itself upon the surface is responsible for much of the mischief.

Eczema Intertrigo (*Intertrigo; Erythema Intertrigo*).

This condition is commonly produced by the apposition of contiguous surfaces of the integument, which become the seat of a moderate erythema in consequence of friction, heat, and maceration of the surface by the sweat, which under these circumstances is abundantly effused. As the process continues an inflammation of the skin results, which is usually aggravated by the conditions already named and by the chemical changes which the imprisoned sweat undergoes. Thus when the voluminous breasts of a nursing woman come in contact with the skin of the thorax, and when in summer the folds of the flesh in the neck of exceedingly fat infants are the seat of considerable friction and sweating; and in other regions of the body where similar conditions exist, an intertrigo of either erythematous or eczematous type is apt to result.

Eczema Fissum; Eczema Rhagadiforme.

These terms have been applied to those patches of eczema in which there has been well-marked infiltration of the skin, depriving it of its normal pliability and extensibility. In consequence, especially over the joints, as for example over the fingers and about the knees and elbows, cracks form in the eczematous skin, generally at right angles to the line of flexion and extension of the member. There is usually exuded from fissures of this sort a bloody ooze, which may desiccate in reddish-tinted crusts covering a whole or a part of the fissure. Rhagades of this character are commonly exceedingly painful and tender, and furnish a frequent complication of eczema of the hands, as it occurs among persons supporting themselves by manual labor.

Eczema Verrucosum.

This is one of the rarer types of eczema seen in regions of the body where the disease has long existed, especially in the aged or those of advancing years. In these instances the skin, which originally presented one of the other types of the disease, usually an eczema rubrum, gradually ceases to furnish an exudate, and the thickened and infiltrated integument rises in wart-like elevations. In extreme cases the hypertrophy comes to resemble the elephantiac state, a voluminous ankle or leg being covered with warty elevations of the surface till it resembles the limb of one of the pachydermata.

Eczema Sclerosum (Keratosis of the Palms and Soles.).

A sclerotic condition of the skin, especially of the integument covering the palms of the hands and the soles of the feet, occasionally results from eczema of these regions. The integument in these cases becomes infiltrated, thickened, and exceedingly callous, resembling in a marked degree the symmetrical keratoses which result from other causes than eczema. In the latter event, however, there has usually been a typical eczema of these regions, usually of erythematous type, accompanied by well-marked itching and other symptoms characteristic of the disease.

Acute Eczema.

When eczema is evolved with acute symptoms, the disorder may be limited to a single region of the body or it may extend to several; or in severe types of the disease it may spread so as to involve the greater part of the entire surface of the body. It commonly begins

as a vesicular patch which in extreme cases spreads more or less rapidly over large areas of the skin; or, what is not rare, the disease may be vesicular in one region of the body, while in yet others there are patches of papular, pustular, or other types of the disease. The outbreak of an acute attack may be preceded by slight or severe rigors, or even by a febrile reaction, such abnormal temperatures usually subsiding when the evolution of the disease is attained. There is almost always in universal acute eczema a great difference between the symptoms presented on the several regions of the body. The thin skin of the face, for example, may exhibit more tumefaction and redness than the surfaces of the thighs, while in other regions of the body the swelling may be inconsiderable and the redness be simply a tinge of dusky crimson. It is rare that the serous discharge is equally abundant in all portions of the body. Acute eczema may rapidly run its course and subside after reaching the usual stage of crusting and desquamation, or it may persist in one or more patches, furnishing thus the beginning of chronic eczema.

Chronic Eczema.

This is an exceedingly common form of the disease, which begins either in the acute form already described or with symptoms which from the beginning are either subacute or chronic. The disorder usually lingers in certain special regions of the body by extension, from which at one time or another there may be again relighted one of the acute phases of the disease; or there may be persistent inflammation of a chronic character involving a larger or smaller area of the skin.

The usual symptoms of chronic eczema are: infiltration of the skin due to thickening of both the epidermis and corium, the occurrence of patches of papules upon the surface, the production of crusts and of scales, and occasional discharges from the surface having the same serous character as those occurring in the acute forms of the disease. A number of titles have been employed to indicate the rare clinical symptoms of chronic eczema, such as spargosiforme, which points to the extreme result of an eczematous condition of long standing when an elephantiac state of the integument is produced, resembling that which results from the occurrence of lymphangitis. In all of the chronic forms of eczema there are frequent intercurrent complications, such as the occurrence of fissures and cracks, the production of few or many furuncles, and the accidents of infection so commonly involving the surface of an inflamed skin, such as result from invasion by the animal and vegetable parasites and by the microorganisms responsible for the production of pus.

Eczema Infantile.

Eczema is exceedingly common in children, especially in those within the first half of the first decade, and, as has been seen, occurs most often in the forms which furnish a discharge, such as the vesicular and pustular. In infants it is a frequent complication of the accidents of the teething process, and is more often seen upon the scalp and face; but in these little patients the disease not rarely spreads over the entire surface of the body. The eczemata of the head are then commonly complicated by enlargement of the glands of the occiput or nucha, these enlargements, especially in strumous children, degenerating into abscesses. The eczemata of this class of subjects are especially significant in consequence of their occurrence chiefly in fat and well-nourished babies as distinguished from those which are suffering from malnutrition.

Diagnosis.

It is of the greatest importance to make an accurate diagnosis in the case of eczema, seeing that the disease is exceedingly common and thus likely to be confused with other less frequently encountered maladies. Often the diagnosis is established with such readiness as not to tax even the most superficial observer. In other cases not only is the diagnosis obscure, but its determination is exceedingly difficult. The errors of the inexperienced are most commonly in the line of mistaking the rarer diseases of the skin for an eczema rather than in failing to recognize the symptoms of the disease as it is presented in its simpler forms. It is always well to remember that among all the protean forms of eczema there are commonly present the symptoms of superficial inflammation of the skin; that there is no tendency to scarring except when the disease is complicated by conditions associated with varicose veins of the lower extremities; and that, among superficial inflammations of the skin not producing ulceration or scarring, eczema alone is characterized by an occasional weeping from the surface, while most of the others are throughout dry and non-discharging dermatoses.

Acne.—Acne, like most of the other disorders of the sebaceous glands, affects chiefly the upper segment of the body; is productive rather of burning than of itching sensations; is frequently characterized by the presence of blackish puncta (comedones), which are never seen in eczema; and further, as a rule, occurs in isolated points often more deeply situated than the ordinary infiltrations of eczema.

Rosacea shares most of the features of acne described above. It

differs from erythematous eczema of the face in that it is cold to the touch rather than hot; in that it is often complicated by telangiectases and other evidences of passive congestion of the surface; and in the fact that in some cases the occurrence of isolated pustules here and there over the cheeks still further indicates the nature of the process.

Dermatitis.—The distinction between eczema and dermatitis is held by some authorities to be a matter of minor importance. The latter term is properly applied to those inflammations of the skin, whether or not exhibiting the characteristic symptoms of eczema, which have obviously been produced artificially. Thus, the application of an irritant or toxic substance to the skin, or an injury inflicted upon that organ by the action either of heat or of cold in excess, or by substances acting injuriously through any medium, often suffices to produce an inflammation of the skin usually corresponding in its beginning to the date of the application, and limited in its area to the region operated upon by such effective cause.

Erysipelas.—This disorder often resembles in its features erythematous eczema, but it is characterized by constitutional symptoms among which thermal variations are conspicuous. There is furthermore a peculiarly smooth and shining appearance of the skin affected with erysipelas, and a vivid color rarely simulated in the dull-red, roughened, papular surface of the eczematous skin. When affecting the face, erythematous eczema usually spares the scalp, which is often and rapidly attacked by the erysipelatous process.

Erythema.—Many of the erythemata are the precursors of an eczematous attack. As a rule, however, there is in erythema little or no itching and merely congestion without inflammation of the skin. Erythema multiforme is especially characterized by the occurrence of isolated lesions awakening no pruritus, and more transitory in their effects than the obstinate forms of papular eczema which they chiefly resemble.

Herpes.—The vesicles in herpes are much larger than those occurring in eczema, are far more persistent, and do not after rupture furnish the serous discharge which produces the typical eczematous crust. In herpes the vesicles are usually grouped and not very closely aggregated. These also usually produce a characteristic pain rather than an itching. In all but exceedingly rare cases, herpes zoster exhibits vesicles arranged in the line of distribution of certain nerves, and is unilateral in situation.

Impetigo.—The several lesions to which this old term has been given all represent infection of the surface with staphylococci. As distinguished, however, from those patches of eczema where a similar

infection has occurred, the pustules in impetigo are fewer, larger, more isolated, covered with bulkier crusts, and much more often limited to the face or upper portion of the body.

Lichen Planus and Lichen Ruber.—In the disease first named the papules exhibited are as a rule much smaller than those in papular eczema; they are flat-topped, polygonal, and crimson-hued, and they furnish a peculiar silvery tinted scale. They are, furthermore, often distributed in the area supplied by definite nerves. In lichen ruber there is commonly no severe itching and almost no scratching of the surface; the acuminate papules are usually agminated in large areas where the scale furnished is so obviously unattended by crust formation as to characterize the disease. In lichen ruber, furthermore, there are frequent evidences of grave constitutional disturbance.

Lupus Erythematosus.—Certain patches of this disease when occurring upon the face may be taken for scaling eczema. Erythematous lupus, however, is as a rule more chronic in its course, its scales are much more firmly attached, its definition is far more perfect, and its frequent scar formation is so significant as to render uncertainty impossible. In some cases, however, the two diseases shade almost imperceptibly into each other. It is well to remember that in erythematous lupus there is never, unless traumatism has occurred, the formation of a distinct crust; and there is also a frequent symmetry of the disease upon the two sides of the face. Further, scaling eczema of the face almost never occurs in well-defined, isolated, and widely separated patches as in lupus erythematosus, where, for example, coexistent patches may be found upon the lobe of one ear, upon the upper lip, upon the side of the nose, and over the brow.

Lupus Vulgaris.—Here characteristic lupous nodules usually suffice to indicate the nature of the disorder. In patches of nonulcerating hypertrophic lupus, there is commonly no itching, while there are obvious characteristics to be recognized in the exact definition, the deep inflammation of the tissue, and the characteristic dull-purplish color which could scarcely be mistaken for another disease.

Pediculosis.—The presence of lice upon the surface of the body is frequently responsible for an attack of eczema. This is especially true when the heads of children are infested with lice, and also in the case of adults, particularly women with long hair of the scalp, where the itching excited by the attacks of the parasites incites to scratching which is largely the source of the local mischief. In a typical pediculosis vestimenti, however, the excoriations upon the shoulders and back are wholly different from those seen even in a severely scratched patch of eczema. The absence of a distinct patch of disease when lice are present, and the wide distribution of the evidences of scratch-

ing over different portions of the upper surface of the body, are here chiefly significant.

Pemphigus, Pityriasis Rubra.—Bullous eczema is to be carefully distinguished from the lesions of pemphigus, which are always large and usually isolated, occur in cyclical manifestations, and are followed by the formation of large pasty-like crusts which are never seen in eczema. Pityriasis rubra, though not characterized by the formation of bullæ, also furnishes an abundance of large parchment-like or papery crusts, which are different from the scales and from the thicker and bulkier crusts of eczema. In pemphigus foliaceus the disease is commonly universal, a rare occurrence in all forms of eczema; and in the severe grades of both diseases here named, the oncoming marasmus with systemic complications, usually points at an early period to a grave disease.

Pityriasis Rubra Pilaris.—The resemblance here to the seborrhœic forms of eczema is often striking; the two diseases are in point of fact at times practically indistinguishable. In pityriasis rubra pilaris, however, the dorsal aspect of the fingers usually displays blackish points, representing lichenoid papules seated at the orifice of the hair follicles. There is commonly also a keratinization of certain special regions of the body, such as the tip of the nose and of the temples, which is never seen in eczema. The peculiar fatty discharge from the surface of the skin seen in seborrhœic eczema is usually wanting in pityriasis rubra pilaris.

Prurigo and Pruritus.—In the disease first named there are commonly present all the symptoms of a severe papular eczema with intense itching and infiltration; but the disease usually begins within a brief period after birth and lasts for a lifetime. It is an affection fortunately extremely rare in this country.

Pruritus cutaneus is as often confounded with eczema as any other disease in the nomenclature. Pruritus, however, unless it has given origin to an eczematous condition, which is not rare, can usually be distinguished from such a malady with the greatest ease. In pruritus when the surface of the skin is unscratched there are absolutely no lesions visible upon the surface. When, however, the itching sensation has induced a more or less extensive scratching of the affected region, the symptoms are wholly those of traumatism of the surface, such as the presence of torn papules and scratch marks. It is a significant feature of most of these cases that intelligent patients are perfectly aware that they themselves are solely responsible for the cutaneous mischief and freely admit the fact when questioned respecting it.

Psoriasis.—In typical cases psoriasis is usually a dry and non-

discharging disease of the skin, with abundant scales far more lustrous and imbricated than those formed in eczema. Psoriasis prefers the extensor, eczema the flexor aspects of the limbs. The patches of psoriasis are usually sharply defined; as a rule they are not productive of itching, and when occurring upon the scalp they mat down the hair with lime-like concretions, which are wholly different from the crusts of eczema in the same region. The removal of the scales of eczema is usually followed by a serous discharge; the curetting of those of psoriasis is succeeded by the oozing of blood at several points. Psoriasis is more chronic than eczema in its course, and is rarely if ever lighted up to acute conditions as is the other disease. Eczema of the face prefers the regions of the lips, of the eyelids, of the nostrils, and of the sides and root of the nose; while psoriasis affects by preference the temples, the cheeks, and the upper line of the brow, where it lingers beneath the hairs projecting from the scalp.

Scabies.—It has been already seen that scabies is really an eczema induced by the presence of acari. The distinction between the two disorders is to be established by the discovery of the parasite and of the burrows made by the female of the acarus as she digs her tunnel through the skin, as well as by the sites of election of the disease, such as, in both sexes, the hands and the thighs; in men, the genital region; in women, the region of the nipple; and in all, the instep, the feet, and such regions of special pressure as those where a truss is applied or corsets are worn.

Scarlatina.—Here the generalization of the disease, the febrile symptoms, the peculiar "boiled-lobster" appearance of the surface which is affected, and the absence of itching and of discharge, are usually sufficient to characterize the disorder.

Seborrhœa.—It has been seen already that seborrhœa and eczema may coexist. In pure types of the former disease, however, there is absence of itching, of infiltration, and of serous exudation. The effused product, whether inspissated and dry as in "dandruff," or oily, never furnishes a crust of the type seen in eczema, though at times voluminous dirty yellowish crusts are formed which project to some distance from the level of the skin. Beneath such crusts, however, the integument is never found in an inflamed condition, but is in an indolent state, furnishing a slowly exuding fatty discharge. Seborrhœa is more often symmetrical than eczema, and, when occurring upon the hairy portions of the body, is much more apt to be productive of a pilary loss.

Sycosis.—This disease occurs only in men and is thus distinguished from all the eczemata of the other sex. The lesions in all forms of sycosis can be recognized on close inspection as distinctly limited to

the hair follicles of the region of the beard. Unbroken pustules can usually be detected in some portions of the affected region, each of which is pierced by a single hair of the mustache or beard. When crusts form they are limited by the same conditions. In eczema of this region there is always more itching, less infiltration, no production of nut-sized and larger "lumps," and no fall of hairs from their pouches. In all parasitic forms of sycosis, the recognition of the parasite suffices for the determination of the disease.

Syphilis.—Many cases occur in which it is difficult to distinguish between certain papular, pustular, and scaling syphilodermata, and some of the forms of eczema. In the first-named disease, however, it is noteworthy that there is often a history of infection, a history of involvement of the mucous as well as of the cutaneous surface, a history of ulceration and of scarring, and evidences of systemic involvement such as rheumatic pains, disease of the bones, of the viscera, etc. Few of the syphilodermata are characterized by any itching and by the production of a color in the lesions which is of the vivid hue seen in most eczematous patches. The occurrence of syphilitic papules or tubercles in groups whose outline represents a circle or a portion of a circle is never seen in patches of eczema save when the latter are complicated by the presence of the parasite in ringworm. Scaling syphilodermata of the palms and soles sometimes suggest eczema of the same regions, but can usually be distinguished by the production here and there over the surface, of discrete horny masses or of losses of continuity where such horny masses have existed. Almost never can one recognize in these cases the uniformly smooth, rather vividly red patch of eczema as it is seen particularly in the palm of a laundress or of a worker in chemicals. In pustular syphilodermata of the scalp and of other regions of the body each lesion is apt to surmount an ulcer of the same size. Syphilitic eruptions encircling the mouth of children are often complicated with fissures at the angles of the lips, and the diagnosis may commonly be corroborated by the discovery of lesions also within or about the anus.

Tinea Circinata.—In ringworm the parasite can usually be recognized by the microscope. When an eczema has been produced by the growth of the hyphæ or when the spores of the fungus have found access to a patch of eczema previously existing, the symptoms of the two diseases are usually commingled (eczema marginatum). Here there is usually a distinct border having a circular outline with its concavity regarding the centre from which the disease spreads, as for example the pubic region, the axillary spaces, the umbilicus, etc. In ordinary patches of ringworm there is little itching. The disease

is far more superficial than in eczema, the scales are fine, and the patches usually very well defined.

Tinea Favosa.—In this disease an error in diagnosis could only occur when there was non-discovery of the characteristic cup-shaped, sulphur-yellow colored crusts characteristic of favus. In this last disease, furthermore, the odor is characteristic, there is no history of discharge, and there is often an atrophied condition left after the long-continued progress of the disorder.

Tinea Versicolor.—In all the tineas the microscope should suffice to establish a diagnosis. In tinea versicolor the delicately fawn-colored or chocolate-tinted patches with the fine branny scales which they furnish disclose such superficial symptoms that they could scarcely be mistaken for another disease. There is no infiltration, and no inflammation; the disease furthermore affects no regions of the body which are exposed to the light. It is rather more commonly seen on the anterior and posterior surfaces of the upper portion of the trunk than in other regions of the body.

Urticaria.—In this disorder the lesions are transitory and are productive rather of stinging and burning than of itching sensations. Characteristic wheals rarely occur in eczema; and in urticaria there is no history of a serous discharge or of the occurrence of the disease in distinct patches.

Prognosis.

A satisfactory recovery may be expected in the great majority of all cases of eczema. The prognosis is only serious when the affection tends to persistence in any one of the chronic forms of the disease; but even these with careful and skilful treatment may be ultimately relieved. The question of the future of any eczematous attack depends upon, first, the general systemic condition of the patient; second, the site of the eruption; third, the age of the patient; fourth, the history of the disease in a present or previous attack; and, lastly, upon the skill exhibited in its management. Eczemata which are obviously associated with a removable cause are far more amenable to treatment than those in which the patient from some predisposition, inherited or acquired, is prone to suffer from recurrent attacks of the disorder. Eczemata of the leg complicated by varicose veins, eczemata of long standing in the aged, eczemata of the gouty, eczemata occurring in the vicinity of the mucous outlets of the body, and eczemata affecting regions covered by long hairs, are as a rule more persistent than those displayed in healthy subjects of both sexes, young in years and exhibiting no other symptoms of disorder.

Eczema of the scalp in young infants and cachectic children, es-

pecially if complicated by the occurrence of furuncles and abscesses of the cervical lymphatic glands, may induce death by exhaustion or septicæmia.

Inasmuch, however, as every attack of eczema may be relieved, it may be set down as certain that the prognosis in even the severest case is not wholly unfavorable.

Treatment.

The importance of a knowledge of the proper treatment of eczema can scarcely be exaggerated. Not merely the comfort but at times, in infants especially, the life of the patient may be at stake; while the reputation of the practitioner is usually at risk when any improper management of this exceedingly common affection is attempted.

In these pages it will not be needed to devote space to a refutation of the argument, from time to time advanced even by men of scientific pretensions, that eczema should not be treated. The plea for such abstention from interference, based for the most part on absurd notions respecting the repercussion of exanthemata, is a relic of the ignorance of the middle ages.

The questions respecting the relative advantages of internal and external treatment in eczema—whether the one should be used exclusively or be combined with the other, and whether in point of fact there is any internal treatment of eczema worth the name—have elicited a vast amount of discussion. An unprejudiced critic reviewing the mass of testimony on all sides would be justified in concluding that no single method could be trusted to relieve in all cases. There is unquestioned truth in the fact that some eczemata demand internal treatment, without which the issue of the management of the disease is disappointing to both physician and patient. There are other cases in which local treatment alone amply suffices. Eczema is a protean disease; its appropriate therapy requires a skilful adaptation of different remedies to the special conditions and requirements of each individual case.

There is no better general rule to be observed in the management of eczema, than that requiring simplicity of treatment. All truly scientific achievements are in the line of simplicity and in none other. The elaborate and complicated methods of treatment set forth in many of the treatises and essays on this subject are in general to be avoided. Medicaments for ingestion or external application to be procured only by importation from foreign countries or from special manufactories or from business houses having exclusive privileges, can usually be exchanged with advantage for articles equally accessible to all and obtainable in the open market.

Hygienic Treatment.

There is no agreement between writers on the subject of the proper dietary for the eczematous. The rules therefore to be observed in this connection should be such only as commend themselves to the good judgment of the general practitioner. The food of the eczematous patient always should be simple. In the case of children errors of the greatest consequence are constantly made by permitting infants even at the breast to consume in excess other foods than the milk of the mother; and children of a more advanced age when at the table are often improperly given the miscellaneous articles of food and drink prepared for adults. Bread, butter, milk, and the lighter meats with limited amounts only of sugar and of the starches should be permitted in these cases. Gouty patients, especially those suffering from eczema of the anus and scrotum, are vastly improved after being for a time subjected to the strict regimen appropriate to such cases. The withdrawal of sugars from patients affected with eczema of the ano-genital region, where the cause is a temporary glycosuria, is an essential part of the treatment; and when these persons are strictly limited for a few weeks to the dietary of the diabetic relief of the local malady by these measures alone often may be secured. Alcohol in every form is to be avoided as a rule by the subject of eczema. Not merely the stronger spirituous liquors but even the malted beverages may be productive of great harm. There are few eczemata, especially of the face, occurring in persons of a full habit of body accustomed to drink two or more pints of beer daily, which will not respond even quickly to simple treatment when the use of alcohol in every form is prohibited.

An important point in the hygienic management of all eczemata except those which are universal, concerns the cleaning and polishing of the general surface of the body which is not the seat of disease. It is a fact well known to most dermatologists that experiments made in a symmetrically disposed eruption by applying one medicament to one side of the body and another remedy to the other side, furnish no test of the relative value of the two agents, seeing that the one side always responds to a successful treatment of the other. In point of fact a symmetrical eczema treated by remedies properly adjusted and applied to one side only, may be relieved when the untreated side merely shares responsively in the amelioration produced by the therapeutic applications to the other. It follows that the greatest possible good can often be obtained by managing the sound portions of the skin of a person having eczema of any single region. Such sound surfaces should be washed daily, at times with

soap and water, at other times with solutions of salt or alcohol and water, warmed or cool according to the special conditions in each case. This sympathetic relation of the two sides of the body has been utilized in the management of chronic eczemata limited in area and affecting a single region of one side, by blistering the corresponding surface of the other side and by afterwards treating the two affected patches in the same manner. Further, an eczema of the head is generally improved by daily scrubbing of the entire bodily surface covered by the clothing; and the same is true of an eczema affecting the legs when the general surface outside of these members is polished after the daily bath.

Climate has an important influence on many of the eczemata. One of the fruitful sources of this disease in the northwestern portion of the United States is the severe pruritus cutaneus induced by the extreme variations of atmospheric temperature occurring in the autumn and spring. As a rule a residence in countries lying near the sea shore is favorable for persons who have contracted an eczema in the inland Territories, as the climate of the seaboard is greatly influenced by proximity to the ocean. In certain of the mountain regions, as, for example, the Alps in Switzerland and the Rocky Mountains in Colorado, the attenuation of the air, the direct action of the sun upon the skin, and the prevalence (especially in Colorado) of storms in which large quantities of sand are sent flying through the air, furnish climatic conditions unfavorable for eczematous subjects.

The clothing of the eczematous patient is a matter of great importance. Woollen undergarments are a prolific source of mischief in many of these cases; and even in cold weather it is desirable to advise the subject of the disease to wear silk, muslin, or linen undergarments next the skin, white or at least undyed, while outside of these may be carried the woollen articles required for warmth. Attention should be paid in many cases of eczema to the fur, velvet, or cloth collars of garments worn about the neck, to the lining of gloves covering the hands, to the dyed stockings or socks upon the feet, and even to the lining of the hat which chances to rest upon the brow.

Internal Treatment.

It need scarcely be said that there is no medicament to be ingested that will of itself relieve eczema. When such a remedy is demonstrated to be effective, eczema will be no longer the disease now known to medical science.

The remedies chiefly valuable in the internal management of eczema are those indicated rather by the patient than by his disease.

Arsenic, which has been largely employed for the relief of eczema by the less expert, is by the experienced exhibited less frequently than any other remedy found useful in the disease. It is of occasional value in exceedingly chronic cases that have not responded to the usual methods of treatment; but in the light of modern science there should be few cases of eczema that do not respond to such treatment. Arsenic should not be ordered in acute cases and should always be administered after food. When exhibited in any case it is found that the large doses useful in other, and especially in chronic scaling diseases of the integument, are not required in order to test the efficacy of the drug in eczema.

Mr. Morris advises antimonial wine in small doses (♏ x. to xiij. repeated every hour or second hour at first) when there is great arterial tension; and the remedy is certainly at times of value. The tablet triturates, however, in doses of from gr. $\frac{1}{50}$ to $\frac{1}{100}$ answer equally well. Cod-liver oil, ordered not merely for strumous children, as in Vienna, but for both children and adults when the skin is poorly nourished, is of great value in chronic cases. Iron in the form both of the citrate with quinine and of the ferruginous waters of many of the Springs, both in America and Europe, exercises a beneficial effect in many cases where there is pronounced atony.

Laxatives and cathartics play a most important part in the internal treatment of many cases, seeing that both constipation and dyspepsia are so frequently encountered in all classes of eczematous patients. At the outset of the treatment the administration of a U. S. P. compound cathartic pill once every week, or of the blue pill, or of a cathartic dose of calomel is often required. The saline laxatives (Carlsbad, Rochelle, Crab Orchard, and other salts, as well as the Friedrichshall, Hunyadi, Congress, and Hathorn waters) often are indispensable. An acceptable solution combining the effect of both a ferruginous tonic and laxative is:

℞ Magnes. sulph., ... ℥ ij.
Sodii chlorid., ... ʒ i.
Ferri sulph., ... gr. iv.
Cardamom. tinct. co., ... ℥ ss.
Aq. dest., ... ad fl. ℥ viij.
M. Sig. Two to four teaspoonfuls in a glassful of pure water before breakfast.

Another formula often found useful is:

℞ Cascar. sagrad. fl. extr. . . . . fl. ℥ iss.
Glycerin.,
Aloes tinct., ... āā fl. ℥ ss.
M. Sig. Ten to twenty drops in a glassful of water when fasting.

In the case of children affected with eczema, calomel has long held a first place in the list of preparations employed for internal treatment. It is best administered to the very young in the form of triturates of the drug, crushed and mixed with a small quantity of milk; but is also given in the form of powders, combined, when there is acid dyspepsia, with the sodic bicarbonate or with prepared chalk. A grain of calomel is often added to two or three grains of powdered rhubarb and five of calcined magnesia when the constipation of children is a pronounced feature of any case. A small dose of rhubarb and the sodic bicarbonate may be given in peppermint water where the calomel is not specially indicated.

In adults with dyspeptic symptoms the essence of pepsin may be employed often advantageously with or without the addition of a few drops of the tincture of nux vomica. The common practice of giving the citrate, acetate, or carbonate of potassium is based upon the good derived from such remedies in lithæmic, rheumatic, and dyspeptic conditions. When there is decided gout, no remedy is of greater value than colchicine salicylate or the wine of the seeds of colchicum pushed for brief periods to large doses, and discontinued at once on the supervention of marked physiological effects of the drug; but salophen, the salicylates, and salts of lithia are often indispensable.

The bitter vegetable tonics, and especially quinine, are of value in special cases. Strychnine, phosphorus, the mineral acids, and ergot also have proved of special service when indicated by the general condition of the patient. Crocker has employed counter-irritation over the vasomotor centres in some instances with marked benefit, using with this end in view either mustard, dry heat, or friction. I have employed the wire brush electrode to the point of producing rubefaction of the skin with similar results.

Lastly, it should be remembered that the methods of treatment of eczema peculiar to the charlatan and practised at times by physicians not only fail of securing the end desired but in the long run work disaster to patients and especially to those of tender years. Thus the administration of the so-called "blood-purifying remedies," composed chiefly of the iodide of potassium, or of the "purely vegetable" nostrums sold with a view to "cleansing the blood," is of no value in the management of the disease. In the same category should be placed a list of remedies often employed for the purpose of assuaging the itching sensation experienced in eczema, such as the opiates, gelsemium, the bromide of potassium, and chloral. There is no method of relieving the itching of eczema, short of producing anæsthesia or narcosis, that can at all compare with local methods properly

adapted and judiciously employed. To relieve the itching of eczema one must relieve the disease. Every eczema is accompanied by itching till thus relieved. Remedies administered internally for the relief of pruritic sensations usually in the end aggravate the disorder which it is sought to remedy. Many cases illustrating the dangers of the cocaine and opium habit have originated in clumsy attempts on the part of the practitioner to relieve the itching experienced during an eczematous attack.

External Treatment.

The majority of all cases of both dermatitis and eczema may be relieved without resorting to internal treatment or to a restricted dietary. The importance of understanding the proper local treatment of the disease can scarcely be over-estimated.

The first step to be taken in the management of any given case is to recognize with care the chief etiological factor present and the special stage which the disease has reached at the date of a first examination. The treatment, for example, of acute eczema is wholly different from that of chronic eczema; each even of the several phases of the disease described in these pages may require a widely different method of management. At one time the affected surface needs to be soothed, at another to be stimulated. In yet other cases it will be seen on examination that the disease is really in a stage of decline, and that with no treatment beyond that of the very simplest protection of the skin from irritation the process will speedily be ended. Most of the suggestions here made will be further considered when discussing the treatment of eczema as it affects the several regions of the body. It must suffice in this connection to furnish details merely of the general treatment of the disease for the majority of all cases.

The first consideration in this connection relates to the washing of the eczematous skin. As a rule all washing of an acutely inflamed skin is productive of both pain and harm; but washing with properly prepared waters is at times, even in acute eczema, productive of both comfort and remedial results. Soap and water are, as a rule, positively injurious to the eczematous surface; but warm water, and preferably rain-water to which has been added the juice of bran, or common starch, or of boiled oatmeal, is often beneficial. It is usual when such washings are desired to place the material (bran, oatmeal, etc.) in a soft muslin bag in the water and to compress it by the aid of the two hands. Whenever it is desired and requisite to remove crusts from the eczematous surface, the use of water in some form is commonly imperative, even in some cases with the addition of soap or green soap to remove bulky or adherent crusts. The latter often

require a preliminary soaking in an alkaline solution or in a salicylated oil of sweet almonds, or in a weak salicylated lard ointment, after which warm water and soap are usually sufficient to free the surface from all pathological products present.

Local Treatment of Acute Eczema.

The best and simplest application to an acutely inflamed eczematous patch is a dusting powder, to the exclusion of all washings, lotions, and unguents. Potato starch furnishes the simplest powder and this as a rule suffices; but the finer grade of talc, lycopodium, bismuth, or magnesia may either be added to the starch or be substituted for it. Boric acid should be added to any powder in the strength of about 1 : 10 where the presence of a parasite is suspected. Van Harlingen employs a starch poultice made by dipping starch and boric acid in boiling water and when cool placing the same in a thin flat bag which is applied to the surface with cheesecloth bandages, the latter may also be usefully employed in keeping the starch or other powder on the skin. The combination of camphor with the other materials used for dusting powders is to be recommended on account of the antipruritic effects of that drug, as follows:

℞ Pulv. amyli, ... ʒ i.
Pulv. zinc. oxid., ... ʒ ij.
Camph. pulv., ... ʒ ss.
M. Make an impalpable powder. Sig. For external use.

Dr. White's plan is also to be commended. The surface is frequently mopped with the ordinary "black wash" reduced one-half in strength, and the skin is then gently massaged with the finger smeared with freshly made zinc oxide salve; or a substitute for the black wash may be made by employing the insoluble zinc oxide or calamine in the strength of one drachm to the pint of lime water, to which has also been added one-half to one drachm of pure glycerin or an ounce of mucilage. Many dermatologists are fond of carbolic acid as an antipruritic agent in acute stages of the disease, and add a drachm or less of it to a pint of weak spirit and water, especially after the exudative stage has been passed. Salicylic acid may be added in nearly the same proportions. The oleated lime-water compounds are occasionally better tolerated than those not containing the oil, and are made by combining the latter either in the strength of the well-known Carron oil, half and half with lime water, adding a drachm of the zinc oxide or of bismuth subnitrate to the pint; or the oil (almond, olive, or cod-liver) may be ordered in less quantity. Carbolic acid may often be added to these formulæ with excellent

results. Substitutes for such lotions may be made by ordering a drachm of glycerin in eight ounces of the dilute liquor plumbi subacetatis, or half an ounce of the fluid extract of Grindelia robusta may be added to a pint of water (Duhring). These lotions often may be applied with advantage on thin muslin cloths saturated with the same, but not so completely covered with dressings as to change the cool application to a fomentation.

When salves are tolerated those first employed should be of the sort described as "cooling." They should never be irritating; and it is imperative that they should be fresh and sweet, as a rancid or acid fatty substance invariably irritates the inflamed skin. Many of the disappointments experienced by physicians in the use of ointments in eczema are due to the fact that a careless or incompetent chemist dispenses a chemically altered excipient as the basis of a salve.

The freshly made cold-cream salve is generally well borne when any unguent whatever is tolerated. The Lassar paste, as modified by us, is one of the most commonly employed of any of the applications which follow the use of lotions and is compounded as follows:

℞ Zinc. oxid.,	ʒ ij.
Talc.,	ʒ iij.–iv.
Acid. salicylic.,	gr. v.–x.
Vaselin.,	℥ ss.

M. Make an impalpable paste. Sig. For external use.

This useful preparation may be made thicker when required for purposes of protection by increasing one-half or more the amount of talc ordered. The paste is commonly made with starch and, when that ingredient is used, its quantity also may be increased. In Europe sticks are made, as suggested by Brooke, of Manchester, with cacao butter, and with this is incorporated any desired medicinal agent. The medicated salve and plaster mulls suggested by Unna also may be applied and kept in contact with inflamed parts. In America it is generally preferable, however, to employ articles of home manufacture for the simple reason that those which are imported are exceedingly liable to undergo chemical changes while *en route*. The glycerin jellies and varnishes suggested by Pick, of Prague, are medicated in a similar way so that any desired ingredient may be applied to the skin—as for example:

℞ Gelatin,	15 parts.
Zinc oxide,	10 "
Glycerin,	30 "
Water,	50 "

Mix by gradual heating. When used, melt and apply with a brush.

The oleate of zinc praised by Crocker often may be added with advantage to equal parts of cold cream salve for a soothing application, or the elegant ointment suggested by McCall Anderson may be used:

℞ Bismuth. oxid.,	ʒ i.
Acid. oleici, ..	ʒ i.
Ceræ alb.,	ʒ iij.
Vaselin.,	ʒ ix.
Ol. rosar.,	♏ ij.

M. Sig. For external use.

In Vienna the stimulating applications more useful in chronic than in acute forms of the disease are applied earlier than in London and in Paris. Thus tar, ichthyol, thymol, and similar substances are employed in solutions of the strength of from one to two per cent., and in nearly the same proportions in ointments of the protective kind, such as the pastes already described.

In acute eczema of the hairy regions lotions are usefully employed, and when fatty unguents are needed it is wise to use vaseline for a salve basis, as a pomade in this way is more readily made to penetrate between the hairs. All crusts should be removed, if needful by the use of soap and water; but when the region is unusually tender, as for example the surface of the scalp, it is better to employ warm local baths made by adding starch, bran, or a thin-cooked oatmeal to the warm water employed. As a rule, the hairs should be clipped short, and in severe cases, when practicable, light caps constructed of white paper or of cheesecloth may be worn over the scalp.

The famous unguentum diachyli albi of Hebra is among the finest of applications for an acutely inflamed skin that will tolerate a salve; but like others named it is extremely liable to undergo chemical changes by the formation of fatty acids and thus to become irritating rather than soothing to the surface. The formula is as follows:

℞ Olei oliv. (opt.),	ʒ xv.
Pulv. lithargyri subtil.,	ʒ iij.+ʒ vi.
Aq.,	q. s.

Mix the oil with a pint of water, heat in a steam bath, stir in the finely levigated litharge, add more water as required from time to time, and stir till cool. Only the best ingredients should be employed.

We are of opinion that the mercurials are more often useful as local applications in an early stage of eczema than is commonly believed; the difficulty heretofore has been that the metal or its compounds have been used in proportions not well tolerated. Calomel and white precipitate ointments are often useful in circumscribed patches of eczema in the strength of from one to three grains to the

ounce, and are often well combined with zinc oxide unguents and even the Lassar paste described above. It is not wise to cover large portions of the body at one time with a salve containing even a weak preparation of mercury, as toxic effects resulted have in a few cases.

Local Treatment of Chronic Eczema.

The first indication in the local management of chronic eczema is the removal of all pathological products present, such as crusts, scales, etc. This end is best reached by shampooings with warm water and green soap, or with the tincture of soap made according to the well-known formula of Hebra, two ounces of the green soap to one of alcohol, digested, filtered, and usually flavored with spirit of lavender. In some cases, as already shown, crusts require a preliminary soaking in oil, or glycerin and water; or when very dense concretions are to be removed, solutions of the hydrate of potash, one part to twenty or thirty of water, may be employed with some caution.

Once completely cleansed, the treatment of the surface is rather stimulating than soothing, yet at the same time even in chronic eczema the simple salves, such as "cold-cream," cucumber, Lassar, and the oleate of bismuth, may answer admirably. In other cases recourse is had to the tars and carbolic acid.

Tar is one of the most valuable of all agents in the management of chronic eczema; the failures attributed to it are as a rule due to lack of skill on the part of the practitioner in properly adjusting the remedy to the condition of the skin. Of late, persistent efforts have been made to substitute for the tars a fish oil known as ichthyol, but there is little evidence to show that this remedy has any advantages over the tars already in the market.

The tar preparations most used are oleum rusci (crude and distilled), oil of the white birch, pix liquida, and oleum cadini. They are here named in the order of their probable merit. Most of them are employed in a strength greater than the eczematous skin well tolerates.

Spender's method in the application of the tars is admirable. An ounce of pure lard is made to boil, and finely levigated chalk in the strength of from one to two drachms stirred in while the lard is in ebullition. This obtunds to a degree the irritating effects of the tar. Just before the unguent is cooled the tar is added, at first a mere smear of the article selected, sufficient to color the unguent; later, and according to the effects produced on the skin, more and more of the tar is added till distinctly remedial effects are procured. When the tar operates satisfactorily, as Hebra first showed, the syrupy ooze

from the patch is not sufficient to raise the salve from the surface, the ointment adhering closely after its application. When, however, the tarry unguent is removed by the exudation from beneath, and when instead of mollifying the itching the application produces a decided aggravation of pruritic sensations, a red blush spreading away from the original patch of disease, the remedy is probably harmful and either should be suspended and another substituted for it, or the tar should be applied in less strength.

The usually accepted strength of a tar ointment is from one-half to one drachm of the tar to the ounce of salve; but when required the pure tar may be brushed over the surface and well rubbed in, or it may be employed in one of several lotions such as:

℞ Picis liquid., ... ʒ i.
Glycerin., ... ʒ i.
Spts. vin. rectif., ... ʒ vi.
Ol. amygd. amar., ... ♏xv.
M. Sig. For external use (Duhring).

Or,

℞ Ol. rusci (vel picis liquid.), ... ℥ iv.
Adipis, ... ℥ i.
Ol. oliv., ... ℥ ss.
Misce et adde:
Terebinth. canadens.,
Sulphur. flor., ... ää ℥ i.
Sig. To be employed two or three times daily with a brush.

Another is:

℞ Picis liquid., ... ℥ i.-ij
Sapon. virid., ... ℥ iss.-iij.
Glycerin., ... ℥ i.
Spts. vin. rect., ... ℥ viij.
Ol. rosmarin., ... ʒ ss.
M. Sig. To be rubbed into the skin with a flannel rag.

The liquor picis alkalinus combines the caustic potash with tar, and is valuable because miscible with water in all proportions:

℞ Picis liquid., ... ʒ ij.
Potass. caustic., ... ʒ i.
Aq. dest., ... fl. ʒ v.
M. Dissolve the potash in the water and add the tar slowly in a mortar with friction (Bulkley).

One to two drachms of this solution may be added to a pint of water as a lotion; and the same strength may be employed for unguents.

Mercury is an exceedingly valuable agent in the topical treatment of chronic eczema, especially when occurring in circumscribed patches. Ammoniated mercury in the strength of from five grains to

half a drachm to the ounce of salve basis, or calomel in the same proportions, may often be advantageously employed. The red oxide may be used for similar purposes in the strength of calomel and white precipitate salves, but it requires a trifle more pharmaceutical skill in its preparation. The protoiodide and biniodide of mercury may be occasionally used with advantage; and the reduced ointment of the nitrate of mercury may be advised in severe cases.

Hebra's method of treating obstinate chronic eczema was by rubbing well into the diseased patch a walnut-sized bit of green soap, then washing the part with warm water by a species of shampooing, and following this with the application of the unguentum diachyli albi already described, this last spread on strips of muslin closely applied by a cheesecloth bandage. In yet other cases where the skin is unusually thickened and sclerous, the soap may be applied as a plaster for the purpose of producing exfoliation. In other cases of similar character, diluted hydrate of potash may be applied to the surface, in the strength of from ten to thirty per cent. till exfoliation is induced. The use of salicylated salves or pastes is, however, far preferable, in the light of modern therapeutics, for in the strength of from one to two drachms of salicylic acid to the ounce of salve basis or such a paste as the Lassar, sufficient exfoliation of the skin may be induced for most practicable purposes, especially if the salicylated application be left in contact with the surface or applied to it continuously by means of a bandage. Pyrogallol in the strength of from five to ten per cent. of either solution or salve, as well as naphthol and chrysarobin, operate on the skin very much in the same way.

Sulphur is chiefly useful in cases which are either of the pure type of eczema seborrhœicum or in cases which are approximated to it. In such affections the sulphur may be employed either pure in the strength of from one-half to two drachms to the ounce of salve basis, or in combination with the red sulphuret of mercury. The Wilkinson salve, popular in Vienna for the local management of chronic eczema, was modified by Hebra as follows:

℞ Sulphur. sublimat.,
Ol. rusci. (crud. vel rectif.), ... āā ʒ ss.
Sapon. virid.,
Adipis, ... āā ʒ i.
Cret. præcipitat., ... ℈ iiss
M. Sig. For external use.

This valuable salve may be reduced when required by its addition in any desired proportions to the ordinary cold cream salve or unguentum petrolei.

An exceedingly effective agent in the treatment of chronic eczema

in circumscribed patches of the non-exposed portions of the body is pyoktanin blue. This may be used in the strength of 1:20, or in saturated aqueous solution. Its remedial influence is probably due in part to its action as a germicide, and in part to its rapid transference of the outermost layer of the epidermis into a thin and opaque pellicle, preventing for the time being the access of light, air, and vapor to the parts which have been painted. The pyoktanin produces no irritative effects and should be applied and reapplied daily or oftener till the removal of the thin layers of deeply dyed cuticle exposes beneath a newly formed and sound epidermis. Second in value to this agent, but operating exclusively in virtue of its effects as a germicide, are solutions of formalin in the strength of from one-half of one per cent. to two per cent. applied for a brief time daily on muslin cloths. Beisell's treatment is probably based on the same principle and is also inapplicable except over portions of the skin habitually covered with the clothing. Crusts are removed by the usual oil soaking and alkaline washings, after which one to ten per cent. solutions of potassic permanganate are painted over the patch once or twice daily for a week, or, when needed, for longer periods. The pyoktanin application is, however, preferable for most of such cases as inducing less local irritation.

Other articles employed in the treatment of eczema, both acute and chronic, might be added to the list already given, but for the most part they occupy a rank decidedly inferior to that of the agents already described. Among these medicaments of minor value the following may be named: mercuric oleates in the strength of from one to two per cent.; iodoform salves in pustular eczema in the strength of five to twenty grains to the ounce of salve basis (usually highly objectionable on account of the odor); thiol, five to twenty per cent. in ointment or lotion (for it is miscible with water); solutions of naphthol 1 : 200 in alcohol in squamous eczema; resorcin one to two per cent. solutions over discharging surfaces; Squire's glycerole of the plumbic acetate (acetate of lead, five parts; litharge, four parts; glycerin, twenty parts by weight), which may be used reduced by adding to it from four to six parts of glycerin and water as an application to chronic eczematous patches; solutions of the nitrate of silver, five to twenty grains to the ounce (probably operating in the manner of the pyoktanin described above); tincture of iodine, effective by a similar process; and chaulmoogra oil (Cottle).

Local appliances, often indispensable in the management of certain varieties of eczema, are the several rubber bandages sold in the shops; elastic, silk, and cotton stockings; and starch, gutta percha, and plaster bandages for the support of œdematous tissue.

The Local Varieties of Eczema.

Eczema of the Scalp.

(Eczema capitis; Eczema capillitii; Pityriasis capitis; Eczema seborrhœicum capitis.)

In this affection the disorder assumes either the erythematous, vesicular, pustular, or squamous type; one or more of these phases of the disease being often commingled. In young subjects the pustular and crusted varieties are more common. In elder patients the scalp more often is covered with scales and crusts reposing on a reddish base. The scalp is affected usually in distinctly outlined patches; rarely the entire surface is invaded.

When the disease is of severe grade the clinical symptoms are wholly different from those exhibited in any other affection of the scalp. The hairs are usually matted together in more or less bulky, yellowish, and sometimes yellowish-green crusts, often emitting an offensive odor. The itching, though not severe, is usually pronounced. In children, and occasionally also in adults, one or more of the glands of the occiput and nucha become tumid and tender, and may suppurate and burst, though this is rare. Minute abscesses also form below the surface of the scalp. It is always necessary in examining young patients affected with this disorder to look carefully for nits upon the hair in order to exclude if possible the presence of pediculi. In young girls with long hair the disorder when lice are present, is very apt to affect the occipital region, in which case the scratched and torn papules of the affected portion of the scalp and of the adjacent region of the neck are highly characteristic.

The seborrhœic form, occurring chiefly in adults, has been previously described. It is readily recognized by the fatty ooze from the affected surface, by the much finer scales, by the small size of the crusts which are furnished, and by the almost invariable involvement of one or both ears, especially the region of the skin lying behind the pinna.

One should be careful to exclude ringworm in all these cases, the last-named disorder being readily recognized when the parasite is discovered. Psoriasis is never an oozing disease, and the scales which paste down the hairs are dry and lime-like. In syphilis there is usually some ulceration, and when carefully sought for, signs of the disease are to be commonly recognized elsewhere. Favus is characterized by sulphur-yellow colored crusts of typical concavo-convex outline, and as in tinea capitis has a tendency to produce patches of baldness due to loss of hair, while in eczema of the scalp there is no

tendency to loosening of the hairs. In long-standing cases of much severity, however, the hairs may be thinned by a gradual process of starvation.

In the management of this disorder it is always wise to clip the hairs short, even in the case of women, as the course of the disease is in this way decidedly shortened and much annoyance is saved. The long hairs, even of young girls, by being subjected to frequent combings, brushings, and braidings, serve as levers for the teasing of the inflamed surface. All crusts are to be removed by softening with an oil or a semi-fluid ointment kept in contact with the surface for some hours by means of a compress and cap. Crusts after soaking may be washed off in a weak alkaline solution of sodic bicarbonate or with warm starch water or oatmeal water, after which an ointment may be applied for the relief of the inflammatory process. The calomel and ammoniated mercury salves heretofore suggested, in the strength of from five to ten grains to the ounce, may be rubbed in with the tip of the finger. The salve basis in all scalp cases should be vaseline, as this is more readily made to penetrate between the hairs. In more chronic conditions the strength of these salves may be increased to double that named above. In simpler cases, however, ointments containing either zinc oxide or creta præcipitata may be used in the strength of from one-half to one drachm to the ounce of the ointment. As soon as practicable, lotions should be substituted for these salves, as the latter are often uncomfortable when applied to the scalp, especially of women. When such changes are made the "black wash" diluted one-half or more, or weak lead lotions, or weak bichloride lotions may be substituted for the ointment. The following is useful in many cases:

℞ Benzoin. tinct., ... ʒ i.–ij.
Hydrarg. chlor. corros., ... grs. ij.–iv.
Glycerin., ... fl. ʒ ss.–i.
Aq. ros., ... ad fl. ℥ vi.
M. Sig. For external use upon the scalp.

It is seldom that the tars are needed for applications to the scalp; but the weaker preparations heretofore formulated may be applied in any obstinate case. The seborrhœic varieties of the disease in this region are usually amenable to sulphur, the precipitated powder being incorporated with a salve basis in the strength of from half a drachm to a drachm to the ounce. When it is desired to add a mercurial, the red sulphuret of mercury may be combined with the sulphur in the strength of from half a grain to one grain to the ounce. Here also the mercurial salves may be found serviceable, as, for example, the red oxide of mercury in the strength of from five to ten

grains to the ounce. A preliminary cleansing of the surface before the application of these pomades is often required; and in this phase of eczema the carbolated lotions and bichloride lotions with the addition of half an ounce of alcohol to six ounces of vehicle are commonly beneficial. When "nits" are present and when for any reason the hairs cannot be clipped, the ova may be destroyed and removed by a lotion of bichloride of mercury in alcohol. Lice can usually be removed by a fine-tooth comb, but they may be readily destroyed by an application of crude petroleum.

Great care is requisite in treating eczema of the scalp in very young infants lest strata of rancid and ill-smelling ointments be superimposed upon decomposing secretions and crusts. It is absolutely necessary to cleanse the scalp with the greatest gentleness and caution and to make applications directly to the inflamed surface. Many of these cases occur in over-fed or over-fat infants, and the regulation of the food of the child is in these instances a matter of paramount importance.

Eczema of the Face.

Erythematous eczema of the face in adults presents such characteristic features that it can scarcely be mistaken for any other malady or any other phase of this special disease. It occurs chiefly among patients of mature or advanced years, and is characterized by symmetrical infiltration of the skin of the face involving chiefly the brow, the cheeks, the lower lids, and the lips. It is tolerably sharply limited at the upper border of the brow by the hairs of the scalp, and in bearded men below by the hairs of the mustache and whiskers. The skin is of a vivid or dull-red hue, and at times there oozes a thin serum, especially after scratching, for in many cases the itching is of the severest grade. In subjects of the disease who have suffered for a long time, the outer limits of the eyebrows are often worn away, leaving in these places merely the stumps of hairs. The eyelids are often puffy; and occasionally in the aged they present characteristic pouches of loosely infiltrated integument; in severe cases the swelling of the lids completely closes the eye. Complaint is usually made that the severity of the symptoms is first appreciated at the root of the nose and the itching and burning sensations spread thence upwards, over the forehead. Viewed closely the surface is seen to be thrown up into minute papules, which in long-standing cases furnish ridges of elevation interspersed with seams. The disorder is always aggravated in those whose faces are much exposed to the weather, and is for that reason oftener seen in men than in women.

In infants and children the disease is apt to assume the vesicular

and pustular phases, especially over the cheeks in teething infants, where eczema often occurs with conspicuous symmetry, involving or not the other regions of the face. The absence of fever readily distinguishes erythematous eczema of the face in adults from erysipelas. Eczema, furthermore, has no tendency whatever to spread upwards over the scalp.

The treatment of the disease in adults is best begun by mopping the surface with the lime-water lotions already described, followed by the use of a simple dusting powder. When the acuity of the symptoms is relieved the simpler ointments may be used, such as the Lassar paste, the freshly made benzoinated oxide of zinc ointment, or the oleate of bismuth salve, the formula for which has been already given. Later the tars may be used, always in a strength much weaker than that employed over the rest of the body. Van Harlingen recommends the use of the following paste, which can be applied before exposure of the face to the weather, and which can be readily removed with warm water when desired:

℞ Tragacanth. gum.,
Glycerin., ... ää ʒ ss.
Sodii biborat., ... ʒ ss.
Aq. dest., ... q. s.
M.

In the case of infants and children the pastes and soothing salves may be used with advantage after the employment of the lotions and the dusting powders. Ointments in young subjects often require to be applied on strips of muslin neatly laid over the inflamed surface and to be kept in contact with the same by means of a muslin mask with orifices for the eyes, the nose, and the mouth. In young subjects suffering from excessive itching, when the eczema affects both the face and scalp, so much damage is done by scratching, rubbing, and tearing the surface that it is often necessary to restrain the hands. For this purpose Dr. White's advice is useful. An opening is made in the top of a pillow case sufficiently large to admit of the passage through it of the head of a child; the arms of the patient are then imprisoned within the pillow case, which is often secured by safety pins to the mattress of the bed or crib, thus preventing access of the hands to the head. As parents often object to what seems to them a cruel procedure, a certain amount of good may be accomplished by enveloping the hands in mits which are fastened by tapes to the dress of the child. Tar should not be used upon the skin of infants and young children thus affected. In these cases, as in those of eczema of the scalp in infants and children, the greatest care must be had in the regulation of the diet. With children at the breast, nursing

mothers should always be prohibited the use of alcohol, and especially of beer, which is often consumed by these women for the purpose of increasing the flow of milk. The feeding to young children of bits of food from the table taken in a promiscuous way from the dishes set before adults, and the permitting of such little patients to use coffee and tea, are highly objectionable practices. Most of these patients are over-fed and mere restriction of the dietary often works wonders. No internal treatment in these cases can compare in value with the administration of small doses of calomel and bicarbonate of sodium rubbed up with the sugar of milk. The Hebra salve when freshly made is usually very soothing to the surface, especially when gently rubbed in by the aid of the finger of the mother.

Eczema of the Ears.

It has been seen that the ears are most often involved as a secondary result of a seborrhœic eczema of the scalp. The treatment of the one in such cases may well be made the treatment of the other. In all acute cases the lime-water lotions can be freely mopped over the part with the addition of an oil if there be much inflammatory redness and swelling. When the ear alone is affected, the disorder is usually of vesicular type, and the drip of the serum is generally conspicuous as it collects upon the lobe of the ear; the organ then often projects notably from the side of the head, and there may be temporary dulness of hearing in consequence of partial closure of the meatus auditorius externus. In these cases as in seborrhœic forms, lotions may first be used with dusting powders and quite effectively when a muslin cap is made and worn continuously over the ear. Later, in both varieties, ointments may be used containing calomel, white precipitate, the red oxide, and the sulphuret, as already suggested, in combination with precipitated sulphur. When it is required to treat the auditory canal, the parts may be cleansed by injections of weak boric-acid solutions, and tampons subsequently inserted, smeared with one of the soothing salves, such as for example the oleate of bismuth. Here also the mercurials are of special service, the yellow oxide and the red oxide being highly serviceable. After crusts are softened and removed, the surface may be gently wiped with weak solutions of the nitrate of silver not stronger than two grains to the ounce, followed by the use of a carbolated vaseline. It is often necessary, when the whole pinna is involved, to bandage the ears to the head gently but firmly. As in some cases the disease is especially obstinate, it may be necessary to employ at times the stronger preparations, such as the tars, ichthyol, and the permanganate of potash, the latter in the strength of from two to five

grains to the ounce. The disease is apt to be refractory and requires in all cases careful management. Long hair worn over the ears, and the fastening of the hat upon the head by dyed ribbons should be avoided. Eczema of the ears is often the result of pediculosis capitis.

Eczema of the Lids (Blepharitis).

In these cases the skin covering the tarsal cartilages may be involved or the free edge of the eyelid. In the latter event there is commonly present a coccogenous sycosis, minute crusts forming about the orifices of the hair pouches, often pierced by the hairs forming the eyelashes. There is commonly a thin sero-purulent discharge, which agglutinates the lids and is often accompanied by a redness of the skin of the eyelid. The effect, as it occurs in children, is very striking to the eye, and as a consequence the disorder is often set down by authors as the result of "scrofula," but the disease has no relation whatever with struma or tuberculosis. Even with the most characteristic symptoms of "tinea tarsi," the signs of "scrofula" can be made to disappear wholly under appropriate treatment. At times the conjunctiva is implicated. In adults, when the affection is of long standing, the eyelids have usually been long picked and rubbed, and the lashes here and there plucked away from their pouches with somewhat disastrous effects, the new hairs often pushing in distorted directions and shapes.

In the management of these cases warm lotions containing sodic bicarbonate should first be employed, and strips of soft linen moistened in a dilute glycerin-and-lead-water wash may be laid over the parts for an hour or more during the day. Afterward, salves may be applied containing the nitrate of mercury ointment, one part to ten of cold cream; or yellow oxide of mercury half a grain to the ounce of the same excipient. Epilation of the lashes is occasionally required. It is often useful to paint the edges of the lid with a weak solution of the nitrate of silver, from one to three grains to the ounce, care being taken to wash away the application and to anoint the edge of the lid before the treatment is concluded.

Eczema of the Nostrils.

Eczema narium occurs both in children and in adults. In the former the symptoms should always be carefully differentiated from the rhinitis of inherited syphilis, which is productive of "snuffles." In children older than infants, the disorder is often occasioned by picking the nose with soiled fingers; and in these cases the staphylococci are responsible for much of the trouble, isolated or confluent pustules,

usually few in number, being clustered about the nasal orifice. In adults and also in children, the picking of the nose may be responsible for the trouble, which in extreme cases goes on to the blocking of one or both nostrils with more or less bulky crusts; the skin of the nose, especially about the nostrils, is often infiltrated and inflamed, and the portion of the upper lip which receives the discharge from the nose participates in the process. In well-marked cases in children there is produced a highly characteristic resemblance to the snout of the lower animals by the production of the swollen and puffy nostrils and lip.

In adults the disorder is frequently produced by a catarrh of the nose indirectly excited by the smoking of tobacco and the taking of hot baths, leaving the subject of the disease unusually sensitive to "taking cold." Here, as in eczema of the lids, there may be a coccogenous, sycosiform inflammation of the hair follicles of the vibrissæ which often require epilation for complete removal of the disease. The mucous membrane of the outer nostrils, as in the case of eczema of the meatus auditorius externus of the ear, often participates in the eczematous process, being reddened, dry, and shining, or becoming the seat of shallow excoriations.

In the treatment of these cases the crusts may usually be softened in the nostrils by the use of an albolene spray which can be medicated when desired with carbolic or boric acid. When the crusts are thoroughly removed from both within and without, semi-liquid ointments may be applied by wrapping the end of a wooden toothpick with a small pledget of antiseptic cotton and smearing the latter with the ointment for application. The addition of a small quantity of glycerin, from half a drachm to a drachm to the ounce of the usual salve basis, will commonly render the unguent sufficiently soft for application to the nostrils in this way. Vaseline may also be used for this purpose. Weak zinc ointments and mercurial ointments containing calomel or white precipitate in about one-half the strength used for the general surface of the skin may also be employed. The ordinary cucumber ointment may be applied externally over the lip. It is prepared as follows:

Spirit of cucumber and white wax, . .	each,	8 parts.
Spermaceti, ...	15	"
Lard, ...	125	"

These are melted together in a mortar and stirred till an ointment is formed. The spirit of cucumber is made by grating three parts of cucumber into a pulp and adding one part of alcohol.

The French usually employ in the treatment of eczema of the nostrils small tampons smeared with either a soothing or an astringent

ointment. Weak carbolic-acid lotions should generally be employed after the epilation of the hairs, and when the adjacent portion of the upper lip requires additional treatment, the application of sulphur salve is of chief advantage.

Eczema of the Lips.

Labial eczema is one of the rarer forms of the disease, but when present is unusually annoying on account of the frequent moistening of the lips with the tongue and their constant wetting with the saliva. The disease occurs most often in children, though occasionally also in adults; and in both is liable to painful and annoying complications by the formation of fissures and cracks, sometimes occurring at the outer angles of the mouth and again at right angles to the axis of the orifice. Reference has been already made to the characteristic and snout-like pouting of the lips when thus affected, especially in young children.

In all these cases soothing lotions may be followed by the use of simple salves after the painting of any cracks or fissures with the tincture of benzoin to which has been added one grain of the bichloride of mercury to the ounce. When there is much infiltration, weak solutions of the nitrate of silver and even of the hydrate of potash, ten grains to the ounce, may be applied with care, the latter being neutralized with an acid immediately after the application. Van Harlingen suggests for the outer edges of the lip an ointment made by combining one scruple of zinc oxide and honey, two drachms of wax, and half an ounce of oil of almonds. Crocker advises fifteen minims of the liquor plumbi subacetatis to the ounce of white vaseline or lard. In many cases the oleate of bismuth ointment and the Lassar paste may be employed with advantage as a substitute. When the upper portion of the lip is involved it should be treated as already advised in considering eczema of the nostrils. Herpes labialis may always be distinguished from eczema of this region by the distinctly isolated lesions of the former disease, and their brief career as distinguished from the more obstinate and itching eczematous affection.

Syphilis of the lips is characterized by fissures at the outer angles of the lips, which are often echoed by mucous patches of the deeper portions within the mouth. It should be remembered that pustules about the lips are apt to result from pediculosis of the scalp, especially in young girls with long hair hanging in braids over the neck, the lips being picked with the fingers in vague efforts to relieve the itching of the occipital region. In all forms of eczema of the face affecting men, the use of tobacco is to be rigidly excluded, especially when employed in smoking.

Eczema of the Region of the Beard.

In this disorder it is not difficult to distinguish the symptoms from those of the several varieties of sycosis, because in the latter the minute pustules presented, or when the pustules have desiccated the resulting crusts, are pierced each with a filament of hair. Further, the hairs in all hyphogenous forms of sycosis are shed from the surface; while in eczema the hairs of the beard and mustache are never loosened in their pouches. In eczema of the region covered by the beard there are, as usual in the same disorder of the scalp, redness, infiltration, itching, and sometimes the formation of vesicles and pustules with resulting crusts. Eczema further differs from the several varieties of sycosis, in that it is not always strictly limited to the region of the beard, but may involve also the cheeks and neck below the hairy parts, and what is not very rare, the ear. No nodules form in eczema as in hyphogenous sycosis; and in eczema when all the crusts are removed the surface, though infiltrated, is seen to be smooth. The presence of a parasite will serve to distinguish the two affections.

In the management of this disorder shaving is required usually on every second day, and the crusts must be removed by boric-acid fomentations or by anointing with carbolated vaseline. After this the zinc oxide and lime-water lotions may be freely dabbed over the surface with a rag, and an ointment may be applied. This is accomplished best at night before retiring to bed, the salve being spread neatly on strips of lint which are kept in contact with the affected surface during the hours of sleep by the aid of a cheese-cloth bandage. The white diachylon ointment or Lassar paste, or weak mercurial salves, may be made useful for this purpose. Sulphur ointments in the strength of from ten to twenty grains to the ounce are of special service, and it is often well to add to the latter a small quantity of cinnabar in the strength of from one-half of a grain to one grain to the ounce. The reduced ointment of the nitrate of mercury is suitable for particularly obstinate cases. In the daytime it is desirable to dust the entire surface with a powder such as boric acid, one part to ten parts of talc. In this disorder, as in sycosis, patients with extremely sensitive faces can be assured that the first shaving is the most painful, and that each successive application of the razor will be less distressing.

Eczema of the Genital Region.

The eczemata which affect the genital region of the two sexes are among the most distressing, intractable, and persistent of the several manifestations of the disease. Naturally they are most significant

after those epochs of life when the function of these organs has been exercised, that is in mature and advanced years; in infancy and childhood, the eczemata of the genital region are commonly the transitory expression of local irritation, such as, *e.g.*, that produced by the soiled napkins of the infant.

The disease in men is apt to fix itself upon the scrotum, but the pubic region and the skin of the penis may also be involved separately or together. In women the pubic region, the labia majora, the labia minora, the clitoris, and even the mucous surface of the vagina for a short distance from the ostium may be involved. In both sexes the lesions are those of erythematous and papular type, as a rule dry and non-discharging; when moist the secretion is derived, especially in the case of women, from the adjacent mucous tracts. In both sexes an eczema of this locality is exceedingly apt to coexist with a similar affection of the anus and perineum. Often the entire ano-genital region displays a single patch of infiltrated, reddened integument, here and there sprinkled with torn papules and even tubercles, some covered with light crusts, a few oozing. In well-marked cases fissures and enormous tumefaction of the external genitalia result. The skin of the scrotum in cases of long standing is thickened and raised in ridges between which run deep seams, the general surface being reddened, torn, and often bleeding from the traumatisms practised to relieve the pruritus. In many instances the incessant teasing of the parts and the consequent rubbings and scratchings during the day, but especially at night, lead to paroxysms not widely distinguished from the sexual orgasm; and the nervous condition of such sufferers becomes in a high degree pitiable.

The etiological factors of importance in these cases are numerous and deserve the careful attention of the prudent practitioner, as many of these cases are relieved without much difficulty when the exact cause has been recognized. The immediately efficient agents are the heat, moisture, and friction of the parts, incidental to the usual method of wearing the clothing in both sexes, and the occupation of the subjects of the disease. Most of these are devoted to some pursuit during the hours of the day, and are not very often hospital or private patients confined to the bed.

The presence of pubic lice should be excluded in every case. The discovery of the parasites, their conspicuous reddish excreta in all cases of long standing, and the exaggeration of the symptoms of the disease in the vicinity of the hairs, will usually suffice to attract attention to this cause.

A well-marked group of these patients suffer from saccharine diabetes; and these may be well divided in two distinct classes. The

first class have suffered from glycosuria for some time previously, and the genital eczema is merely a transitory complication of the other trouble. Here the phenomena of the disease in the two sexes are conspicuous and annoying, but are rarely characterized by the severity of the symptoms displayed in the second class. In the former the eczema is commonly relieved without difficulty, the glycosuria persisting after disappearance of the local phenomena. The second class suffer from a transitory glycosuria and display formidable features of the genital disease, the parts dripping with serum; micturition being exceedingly painful on account of the great tumidity of the organs and the contact of the urine with the skin at every emptying of the bladder. Patients of this class are usually large consumers of beer, fleshy, and voiding urine not merely loaded with sugar but with urates. Here with a proper dietary the local disease disappears at about the same time with the sugar in the urine, and may appear in a second attack of glycosuria.

In yet another group of patients, the local disease is due to gout. This influence in eczema has been strongly contested by some authors; but the importance of gout as a factor, at least in eczema of the genital region, scarcely can be over-estimated. It is in these cases of fleshy men and women with urine of a high specific gravity who eat largely of meat and daily consume wine or beer in large quantities, that a strict regimen is of a value scarcely to be recognized in other varieties of the disease.

In women discharges from the vagina are responsible for many cases where a leucorrhœal, semi-purulent, or even fetid secretion comes in contact with the labia. It is rare, however, that similar discharges in the other sex are as effective, because of the ease with which even the lower class of men succeed in preventing such secretions from coming in contact with the scrotum.

In the management of these cases the dietary, whether there be sugar present or not, is of prime importance; and the habits and occupation of the subject of the disease have often to be regulated for a time. All parasites are to be destroyed with the nits of any pediculi present, and treatment should be directed in the case of women to the suppression of all vaginal secretions capable of aggravating or producing the disorder. The bowels should be daily evacuated and the urine be rendered bland and unstimulating, if necessary by the free use of alkaline and diluent beverages.

Emollient baths are usually grateful made with bran four pounds, or starch one pound, or gelatin two pounds, or linseed meal one pound to a bath of about thirty gallons. Or alkaline baths may be employed: bicarbonate of sodium four ounces; or carbonate of potas-

sium two ounces; or borax three ounces to the same quantity of water. In the place of these or as supplementary to them, lead-water lotions may be employed, or lime water and zinc oxide, as suggested in the treatment of acute eczema. After application of these lotions a dusting powder may be used, such as McCall Anderson's when triturated finely, or lycopodium, or talc. If the itching be obstinate a pencilling with nitrate of silver, rarely of greater strength than from five to ten grains to the ounce, may be employed.

In obstinate cases the scrotum, as contrasted with the vulva, will often respond to treatment by green soap and tar ointments, provided the strength of the latter be properly adjusted, beginning with the weaker formula, and increasing to the strength if need be of from half a drachm to one drachm to the ounce of salve basis. In women the diachylon salve is better. The mercurials are of special value in many cases.

Eczema of the Anus and Anal Region.

The several eczemata of the anal region are related for the most part in their etiology to the similar affections of the genital region described above; and the rules respecting the treatment of the one apply in large measure to the management of the other. Eczemata of the anal and genital regions may often occur at the same time in a single subject, the one affection representing an extension in area of the other.

The presence of ascarides in the rectum should always be excluded at the outset of treatment; and care should be had to recognize hemorrhoids when these complications exist. Often when no hemorrhoidal tumors external or internal can be discovered, careful inspection will reveal, just within the anal verge, the presence of minute ulcers which may be made to heal readily after pencillings with nitrate of silver either in stick or in solution. It is to be borne in mind, however, that many persons suffering from piles never complain of anal eczema; and on the other hand that many subjects of the last-named disease suffer in no way from hemorrhoids. The popular title "itching piles" relates usually to an anal eczema and to little else.

In children the disease must be carefully distinguished in all cases from syphilis, whose manifestations are exceedingly apt to be fixed in this locality and even to be productive of itching sensations. In infants who are not victims of syphilis, the local disorder often results from lack of care in the changing of napkins.

In adults it is important to distinguish all anal and ano-genital eczemata, especially when the regions outside of the ano-genital oval

are involved, from eczema marginatum which is due to invasion by the trichophyton. Here the spreading of the inflamed patch in circles away from the genital centre over the abdominal surface or over the inner faces of the thighs, is significant, especially when the characteristic "festooning" of the border of the patch is in circles whose convex outlines are directed centrifugally from the pubic region.

In typical cases of anal eczema the skin about the anus is infiltrated, reddened, and often seamed in lines radiating from the centre of the anus. The vesicular and purulent types of the disease are less often encountered here than the erythematous and the papular, as in eczema of the genital region which is often associated with that of the anus. The disease tends to spread upwards between the cleft of the nates; at times the buttocks are covered with lesions. Care should be had not to confound the symptoms with those of lichen planus, which is occasionally to be recognized about the anus, with rather large-sized, flat-topped papules conspicuously running along the line of the raphé to the scrotum in men; nor with those of zoster of the same region, which is, however, usually monolateral in situation and displays large-sized vesicles rarely seen in eczema of this part. In both anal and genital eczemata, further, the existence of chancres, of mucous patches, of mucous tubercles, and of gummatous deposits is to be carefully excluded, as all these lesions are not rarely found in this region. Large fleshy-looking tabs about the anus, especially in women (*languettes*, of French authors) often accompany syphilitic strictures of the rectum, the existence of which is at once declared on digital exploration of the organ. As many of the syphilitic lesions of these parts are characterized by noticeable itching, the question of diagnosis is not without special importance.

In the treatment of these disorders, hot local baths and lotions are of chief value. Sponging of the parts with very hot water usually allays the pruritus for a time. Where there is distinct limitation of the patch of disease to the vicinity of the anus the possibility of the presence of vegetable parasites must not be forgotten: and then local applications of lotions of the hyposulphite of sodium, one drachm to the ounce, followed by mercurial unguents, usually prove serviceable. Pyoktanin blue may be usefully employed in all circumscribed patches, the applications being repeated again and again till the pruritus and infiltration have subsided. The tars may be employed with manifest advantage in adults, but never in the case of infants and children.

The Wilkinson salve and the Lassar paste are suitable to many cases; in fact, where the disease is not of formidable type, the paste last named incorporated with five grains of ammoniated mercury to

the ounce often suffices to procure relief. The French usually order enemata for the purpose of emptying the bowel and afterwards insert in the anal orifice medicated tampons. For some years past I have been pleased with the simple device of thoroughly lubricating the ano-rectal pouch before each stool with an unguent containing one-half to one drachm of the tincture of benzoin to the ounce of vaseline cold cream (half and half), applying over the neighboring skin either a paste or an ointment appropriate to that part. The irritation set up by the passage of fæces over the tender surface is thus largely obviated. The use of cocaine in this region is to be deplored, as absorption readily follows and the cocaine habit is easily formed. The dusting powders are always adaptable as a dressing for the hours of the day; and the nitrate of silver is required for all radiating fissures. Laxatives are demanded for most cases; the solution of sulphate of magnesia, Hunyadi, Friedrichshall, Hathorn, and other waters serving admirably, especially when taken before breakfast. The diet is of the highest importance, most fleshy patients improving when meats are either wholly excluded from or largely limited in the permitted dietary; and when both alcohol and (in the instance of male patients) tobacco are forbidden. Exercise in those of a gouty predisposition and avoidance of the use of thick cushions when seated (as well as of the saddle of the horse and of the bicycle) are important measures.

Eczema of the Extremities.

Eczema of the upper extremities differs chiefly from the same affection as it attacks the lower limbs in that in the latter case the force of gravity usually complicates the progress of the disorder. Eczema of the arms, as might be expected from what precedes, is a dermatosis chiefly affecting the axillary space and the flexor aspect of the elbow joint. In both localities it is not very rare to discover a symmetrical affection of both arms when the patient is the subject of a seborrhœic form of eczema. In this event other regions of the body may be typically involved, as for example the scalp near the temple, the ear, the root of the neck, and the intermammary space. In such cases, the treatment of the disease as it affects the arms is that described under the title of the general management of the affection. The seborrhœic forms commonly require the use of the salves containing sulphur, tar, and pyrogallic acid. In the ordinary types of eczema affecting this part the treatment is readily conducted in consequence of the facility with which both lotions and unguents are kept in contact with the surface by the aid of cheese cloth or roller bandages. Circumscribed scaling patches of eczema in these locali-

ties are best treated by the application of pyoktanin. The soothing salves are useful in many cases.

Eczema of the lower extremities is, next to the head, in children, one of the commonest localizations of the disease. It is apt to be exceedingly intractable on account of the occupation of those who stand a great deal upon the feet (motor-men, street-car drivers, wheelmen of vessels, women standing at a counter, etc.), and in the aged where weakness of the tissues fails to offset the blood pressure from above. All the phases of eczema rubrum are here displayed in extreme expression, large and numerous patches or even the entire surface of one or both legs, as distinguished from the thighs, representing the area of involvement. In these cases there may be much weeping, and, among the poorer classes of dispensary patients, even a good deal of suppuration. Scales and bulky crusts are sprinkled over the surface, infiltration is marked, and sometimes there is excessive œdema. The extreme pictures of sclerous and verrucous eczema are exhibited in elderly persons of both sexes who have for a long time suffered from eczema of the legs where the treatment has been improperly adapted to the conditions present.

Varicose veins of the lower extremities are a common complication of eczema of the legs and frequently furnish the remote cause of the disorder. The long-continued pressure of the blood column upon the weakened skin renders the latter sensitive to slight causes of local irritation, such as friction with the coarse and often soiled clothing worn by the lower classes, the application of cheap soaps, the employment of stimulating liniments for the purpose of relieving the earlier symptoms of the disease, and the wearing of garters, pads of trusses, and other articles capable of interfering with the return of venous blood from the extremity. In women who have borne many children, and especially in those who have suffered from one or more attacks of "milk-leg," the varicose condition of the lower extremity is apt to lead to an eczema of the same part.

Eczema never results in ulceration save when complicating varicose veins of the lower extremities. In these cases the ulcer usually forms on the anterior surface of the leg, more often in the middle or lower third than the upper, and presents itself as a shallow, glazed, or granulating and empurpled lesion often hemorrhagic, and the seat of exquisite pain. It is necessary in all these cases to distinguish carefully between these ulcers and those of syphilis which frequently occur in the same region. In the disease last named the ulcers are deeper, are more apt to be covered with a sloughy floor, and have characteristic clean-cut or punched-out edges, usually elevated as distinguished from the thin edge of the eczemato-varicose ulcer.

In making a diagnosis from the scars left by such lesions, it is well to remember that the denser pigmentation in hues of deep chocolate or black, widely dispersed over the anterior surface of the leg, are much more apt to result from the varicose condition than from syphilis. In the latter event the pigmentation is usually more distinctly limited to the shallow superficial scar which is the sequel of the gummatous process, and is furthermore apt to characterize but a single lesion in the extremity. Where multiple lesions have existed the number of scars corresponds to that of the preceding ulcers, and the tumefaction is more or less distinctly limited to these parts; while in eczema the staining is diffused, spread as it were at random over the face of the limb, and the scar resulting from the varicose ulcer is less superficial, less well defined, and less smooth, being oftener puckered, seamed, and attached.

The indication for treatment in all these cases is the removal of the effectiveness of the force of gravity either by placing the limb permanently in the horizontal position till relief is had, or by artificial support of the tissues. In all severe cases both methods are required. The limb is first placed in a horizontal position on a bed or couch and properly dressed till the acuity of the symptoms has subsided, after which the dressings are combined with artificial supports.

The ointments useful in these cases are the ordinary zinc oxide, the Lassar, the diachylon, and the mercurial salves. In almost all cases a dusting powder is required after the application of the ointments. When the limb is in a horizontal position, zinc oxide and lead lotions are superior to all else, followed by a dusting powder. When the patient is again permitted to use the limb, it may be smeared with a boric-acid ointment one-half a drachm to one drachm to the ounce, or the ointment of the oleate of bismuth.

The dressing of the limb when it is again to be used in locomotion, is a matter of no little importance. After the application of the unguent, followed or not with the dusting powder, in both sexes a long white stocking such as is commonly worn by women only, should be drawn over the limb. The part is then supported by a roller bandage properly adjusted by a skilful hand; or when this is for any reason impracticable, a flannel bandage cut on the bias may be made to encircle the limb without producing undue compression even by the inexpert. As progress is made toward recovery, especially when varicose veins are present, silk elastic or the cheaper cotton elastic stockings may be worn, or what is less preferable the rubber bandage. Fox's tubular bandages in different sizes slipped one over another, furnish an admirable means of supporting the tissue. Much

firmer and more energetic pressure of the limb is required in those extreme cases where an elephantiac condition has been produced.

Eczema of the Hands and of the Feet.

When eczema affects the hands, one of several conspicuous features is its selection of the soft tissue of the interdigital spaces and of the back of the hand, as contrasted with the denser and thicker palm, which is much more often involved in early and late syphilis. Eczema occurs as a disorder limited to the region of the palm only under exceptional circumstances. Patients thus affected are as a rule those whose hands are habitually immersed in hot or cold water, in irritating fluids, or in water which is charged either with chemical substances or with inert material acting traumatically (laundresses, bar-keepers, "soda-water-fountain" boys, chemists, tile-layers, and workers).

The palms may be symmetrically involved in this class of subjects, but in right-handed patients the right hand is usually that which displays the greater number of lesions and those of severer type. Occasionally the left hand is worse in right-handed patients; and when this is found to be the case the apparent contradiction can usually be explained by discovering that the predominantly used hand is shielded, while the other is most exposed to the adverse influence.

The symptoms in these cases are singularly uniform. The palm or palms are usually the seat of an infiltration accompanied by redness limited with tolerable distinctness to the palmar region. The itching is severe; and the parts often well rubbed and scratched. In consequence of the friction to which the palms are habitually subjected, the surface is usually smooth and not elevated into papules or covered with crusts. In extreme cases painful fissures occur, usually at right angles to the axis of the organ.

Eczema of the hands, not limited to the palms but affecting chiefly the dorsal and interdigital surfaces, almost invariably betrays the effects of manual labor in the symptoms briefly pointed out above, for example, the graver implication of the predominantly used member. Even in one hand the portion chiefly affected points to the same exciting cause, as for example where the thumb, index and middle fingers, and the parts about them are chiefly involved in the case of the tailor, who for several hours a day wields his shears with these fingers; or where the seamstress exhibits aggravation of her symptoms in those parts of the two hands where on the one side she handles the needle, and on the other the dyed and often coarse fabric which may be in part responsible for the mischief. The play of the

starched cuff at the wrist in both sexes, and of the rough sleeve of the coat or jacket in winter, is usually well defined in the eczemata which are thus evoked. Many indeed of the severe types of this affection occur in the winter season, when the hands are enveloped in fleece-lined or in wool-lined gloves or in mittens worn for the purpose of keeping the hands warm. Scabies should always be carefully distinguished from eczema of the hands. In the former affection, the discovery of the parasite, of the characteristic burrows made by the female, of multiform lesions (vesicles, papules, pustules, scratch-marks, etc.) about the interdigital spaces and the wrists, is of special importance. It should be remembered, further, that scabies of the hands is in cases of any duration almost certain to be declared elsewhere (axillary spaces, genital and mammary regions, etc.), while eczema of the hands is as a rule limited to these organs. Pompholyx is never to be confounded with either of the two diseases named above, seeing that its lesions are usually large blebs occurring on the sides of the fingers and on the backs of the hands, generally in persons who are cachectic or broken down in constitution.

In the management of these cases the disuse of the hands is imperatively required when such an end can be secured. Most tradespeople admit that the hands are better on Monday morning than on Saturday night, when Sunday has not been employed in toil. There can be no better hint as to the appropriate therapy. If not wholly disused, the hands should be protected by any measures which are practicable in the life of each individual.

All acute forms of eczema of the hands should be treated by the exclusion of soaps, and by bathing with any one of the emollient washes already described, or with milk in which has been boiled a bag of rice. The lime-water and lead lotions may then be applied, followed by a dusting powder. All the soothing ointments are useful (cold cream, cucumber, oleate of zinc or bismuth), especially when spread on narrow strips of lint which are then neatly wrapped separately about the individual fingers and the hand. The starched cuff should be removed; or the wrist, when affected, should be protected by strips of muslin anointed with unguents and fastened *in situ*. The cheap white muslin gloves sold in the shops and employed chiefly by caterers' assistants, answer well for many cases. In patients with slight eczema of the hands such gloves may be worn at night only; others who require their use during the day can wear outside of them, as less conspicuous, a dark glove or a silk mit.

The chronic forms of eczema of the hands require more stimulating preparations, such as tar ointments, the Wilkinson salve, the mercurial ointments, and, in circumscribed patches, pyrogallol or

chrysarobin. Circumscribed and scaling patches are best treated with pyoktanin blue, or with the permanganate of potash in the strength of one part to ten, repeated daily till a blackish crust forms over the patch. Fissures should be painted with the tincture of benzoin containing the bichloride of mercury one grain to the ounce, or with flexible collodion.

In eczema of the palms the parts should be shampooed regularly with green soap and hot water, and stimulating ointments applied containing mercury, especially the ointment of the nitrate of mercury and salicylic acid. Often the mercurials can be combined with the tars with considerable advantage, from ten to twenty grains of ammoniated mercury being added to the ounce of lard, the ointment containing also one drachm of prepared chalk, ten minims of the oil of sweet almonds, and one-half of one drachm of the oleum rusci. In other cases the salicylated pastes may be used, as for example the Lassar, adding from a scruple to a drachm of salicylic acid to the ounce of salve basis. Where the thickening is great, the callous parts may be washed for a few minutes each day with a 1 : 100 solution of hydrate of potash. Mercurial plasters in very obstinate cases can be used with advantage applied to the palm at night by means of a bandage. The salicylated rubber plasters, if neatly moulded over the surface, can be worn for several hours each day with advantage in many of these cases.

Eczema of the soles of the feet is less common than eczema of the palms of the hands, and is to be treated on the same general principles. Eczema of the feet is most common about the toes and the interdigital spaces, spreading thence upwards over the instep. It is not to be confounded with the disorder known as symmetrical keratosis of the palms and soles. This last-named affection is characterized by a symmetrical and callous thickening, usually of the entire surface of both palms and soles, without inflammatory symptoms. Little if any itching is present; the parts may even be bathed with a cold perspiration; the nails may be tilted away from their nail-beds by the production in excess of a horny material beneath the free edge of the nail; and a blush of passive erythema usually spreads for a short distance away from the yellowish leathery mass encasing the palm or the sole. Chilblains, especially of the toes, but also occurring elsewhere on the feet (pernio) are characterized by erythematous patches of a dull-reddish hue, occurring chiefly in cold weather and in patients of a *delicate* constitution. In extreme cases there may be the formation of blebs and the occurrence of superficial ulceration. One must be careful also to distinguish the ill-defined patches of redness which occur upon the dorsum of gouty toes, often accompanied by œdema

and other symptoms of the acute stages of that disease, in persons of middle life and advanced years. The existence of hard and soft corns or of bunions, the wearing of woollen and dyed stockings and of ill-fitting boots and gaiters, and the unnatural sweating of the feet produced by wearing enamelled and rubber boots, may all be productive of mischief in these cases. The treatment of eczema of the feet is practically that of the hands already discussed. Disuse and elevation of the feet to the horizontal position is essential in severe cases; and in those where the patient is allowed to continue his vocation, the separate wrapping of each of the digits with salve-spread muslin or plasters is of special importance.

Eczema as it Affects the Nails.

The nails themselves are only indirectly affected in eczema, as the disease attacks the soft parts of the finger about the matrix, the nail-bed, and the nail-folds. The skin about the nail becomes reddened, thickened, and the seat of considerable itching. The scratching of eczema of other regions is here often supplemented by picking, so that shreds and tags of scaling epidermis often surround the altered nails. The nail-plates soon lack their natural polish and lustre, the portion overlying the matrix, in consequence of malnutrition, shows as a thinned corneous stratum unusually depressed below the natural level. It is rare that the nails are actually shed or tilted up at the free border. This occasionally happens in consequence of abundant formation of scales below the projecting edge of the nail.

The treatment is by slightly shampooing the affected surface with green soap and warm water, followed at first by the use of the diachylon salve, and later by tar ointments, the Wilkinson preferably, spread on bits of muslin and retained by properly made cots. The free border of the nail should always be cut short to prevent irritation as a result of contact with foreign bodies.

The diagnosis is to be established by excluding trichophytosis, psoriasis of the nails, and syphilis. In the first case the scrapings of the nail will disclose the parasite; in the second there should be evidences of the disease elsewhere; and the same is true of syphilis of the nail, with the added features that ulceration is apt to occur especially at one side of the nail in its line of contact with the nail-fold, where a fungous granulation may push the nail to one side of its normal axis.

Eczema of the Nipples and of the Breasts in Women.

This disorder commonly results in nursing women either from galactorrhœa, the milk which escapes from the nipple after the child

has been suckled, flowing over and thus irritating the inferior surface of the breast; or from irritation caused by direct contact of the mouth of the child with the nipple and areola. The affected region may exhibit vesicles, pustules, papules, or ill-defined patches of infiltration having a reddish aspect and presenting the type of erythematous eczema. One or both breasts may be involved.

In women having voluminous breasts even when not nursing children, eczema with nearly the same features, but starting in the intermammary region and spreading thence over the surface of one or both breasts, may begin as an intertrigo and be aggravated by the accumulation of sweat between the breasts and also between the skin and the adjacent clothing (flannel wrapper, corsets, etc.).

Special care should be had in the case of eczema of the nipple and areola to distinguish the affection from that known as "Paget's disease of the nipple," or malignant papillary dermatitis. This is an epithelioma beginning superficially, simulating an eczema of the nipple but spreading deeply downwards till there results a cancerous involvement of the epithelial lining of the lacteal ducts. In these instances the chief distinguishing symptoms are a vividly reddened patch spreading from the nipple often symmetrically, better defined than an eczema of the same part and commonly presenting a characteristic induration of the deeper tissue, so that when the integument is gathered between the thumb and finger a firm disk may be recognized beneath, corresponding in size to that of the reddish and usually oozing patch visible to the eye. In all doubtful cases great care should be had to explore the axillary regions for evidences of adenopathy, enlargement of neighboring glands being rare in eczema of the mammary region; and also to examine the entire breast with a view to excluding what may usually be recognized in cases of Paget's disease of any duration, namely, nodules representing a cancerous change either in the gland tissue itself or in the duct leading to the nipple. Paget's disease has been assigned by Darier, Wickham, and others to the category of the psorospermoses.

Scabies, it should not be forgotten, is a common affection of the nipple and breast in women; it is readily recognized by the axillary papules and burrows usually present, by similar lesions upon the surface of the breast, and in nursing women by characteristic symptoms upon the cheek of the infant. Chancres of the nipple with indurated syphilitic bubo of the axilla of the side corresponding to the breast, is distinguished by a sclerosis much more defined than either the lesions in Paget's disease or those of eczema. The chancre is usually superimposed upon a dense and large induration and begins as a rule in women who have suffered from a fissure

of the nipple and who have suckled at the breast another child than their own.

The treatment of eczema of the breast and nipple is with soothing lotions, dusting powders, and cooling salves. When fissures occur, every effort should be made to avoid weaning a child dependent upon its mother's milk; and in such event pencillings of the crack with weak solutions of the nitrate of silver or with compound tincture of benzoin may be used. The Lassar paste, made sufficiently stiff with talc to resist simple contacts sufficient to remove a softer unguent, is an admirable application to these surfaces. All lotions and salves require removal with a weak alkaline and glycerin wash before the child is put to the breast. The use of the rubber nipples and shields sold in the shops is not wholly satisfactory. In treating eczema of this region it is of value to spread strips of soft muslin with the unguent or pomade ordered, and to retain the dressing in contact with the inflamed surface by the aid of cheese-cloth bandages.

Eczema Intertrigo.

This is commonly a complication of a simpler erythema intertrigo. It occurs in regions where surfaces of the skin are apposed and subjected to such aggravating causes as friction, excessive heat, and imprisonment of bodily secretions, chiefly sweat, between folds of the skin. It is encountered about the neck of very fat infants, between the thighs of corpulent adults, between the lower surface of the abdomen and the thighs of fleshy persons with voluminous and pendent bellies, between the breasts of women, and also, when these glands are voluminous, between the breasts and the skin of the abdominal surfaces upon which they rest. The secretion of such patches of disease, at first corresponding for the most part in area to the regions of contact, often fails to stiffen linen, showing that the fluid effused is largely composed of sweat. Usually a linear fissure may be detected at the fundus of the angle formed by the juxtaposition of the two inflamed surfaces.

The treatment requires separation of the apposed parts by thin layers of antiseptic lint smeared with a soothing ointment such as Lister's borax salve:

℞ Acid. boracic. subtil. pulv.,
Ceræ alb., ... ää grs. xv.
Paraffin,
Ol. amygd. dulc., ... ää ʒ ss.
M. Sig. For external use.

Before such dressings are made, however, the ill-smelling secretion should be gently removed and the surface cleansed by washing in

bran water or in an alkaline bath. A few drops of chlorinated soda are often needed to correct the odor. In many cases internal treatment is required to control the predisposition to the affection, as numbers of these fleshy patients are gouty, consuming in excess beer or alcohol in some other form, and enjoying a too generous diet. Here the administration of the alkalies, the salicylates, salophen, and colchicine may be of service.

Eczema of the Umbilicus.

This disorder is usually originated by a seborrhœa oleosa affecting the umbilical pouch in fleshy or poorly cared for children. As a result of neglect, occasionally even after too scrupulous cleanliness on the part of a mother, an ill-defined patch of disease spreads away from the umbilicus as a centre, over the abdominal surface. It is strictly of eczematous type, being infiltrated, reddened, and the source of considerable discomfort by the production of itching. At times, when the disease is of some duration, the navel becomes tumid and pouts externally as in the case of eczema of the lips in children.

The treatment is that of intertrigo. The liquor sodæ chlorinatæ is required in washing, for the purpose of correcting the offensive odor. In children the soothing salves can be applied, inserting within the umbilical pouch tampons smeared with the unguent and retained by the aid of a bandage over the abdomen. Obstinate cases require pencillings with silver nitrate solutions, five to ten grains to the ounce. Scabies, syphilis, and pediculosis are to be excluded.

Eczema Parasiticum. Eczema Marginatum.

An eczematoid patch may display a definite margin with clearly defined outline. It is hence often assumed that the disease is associated either in etiology or aggravation with the existence of a vegetable parasite. This is a wholly inadequate explanation of the definite contour seen as an exceptional feature in these cases of eczema, since the discovery of a parasite is essential to settling the question of parasitism and, further, in order to establish a justification for the term "parasitic eczema," there should properly be present in all similar cases the same parasite.

That, however, many patches of eczema with definite contour are actually of parasitic origin cannot be denied, and the treatment which is most effective in such cases is that directed to the destruction of the effective germs.

Eczema marginatum, as heretofore explained in these pages, is one of the types of eczema either in which that disease is induced by the presence of the trichophyton, or in which the trichophyton has been

implanted by accident upon a preëxisting eczematous patch. The marginate and festooned rings of these patches most often spread from the pubic, axillary, or umbilical centres, with the convex border extending centrifugally from the point of origin. The activities of the inflammatory process are usually greatest at the border of each patch, though the enclosed area under favorable circumstances may exhibit infiltration, redness, papulation, etc., with no little itching as a result. All such cases call for either the use of dilute acetic acid followed by lotions of the hyposulphite of sodium one drachm to the ounce of water, or for the application of sulphurous acid from a freshly opened can mopped over the part. The after-treatment is that of eczema. The tars and mercurials may be needed later.

Crocker's "eczema circumscriptum," occurring chiefly on the legs and arms in reddened patches made up of minute papules which scale, belongs to the class here described. It is of more common occurrence than is generally supposed. This and all other circumscribed patches of parasitic eczema in adults not affecting the face, are satisfactorily treated by painting with pyoktanin blue till the disease is at an end. Where the blue color produced by the effective germicide is an insurmountable obstacle to the conduct of the treatment, weak sulphur and mercurial salves are efficient but less speedy in action.

One of the forms of eczema which Unna claims to be invariably parasitic is

Eczema Seborrhœicum.

The symptoms of this composite affection have already been enumerated. It occurs in pityriasic type with a resulting alopecia over the scalp: in a squamous form with fine greasy crusts and scales, over the temples, ears, brows, axillary spaces, chest, umbilicus, and elsewhere: and, in a strictly catarrhal, or more purely eczematous type, in any of the regions named above, where a sero-fatty discharge is furnished by the reddened, infiltrated, and scaling surface. The circumscribed patches of seborrhœic eczema over the anterior and more rarely over the posterior surfaces of the chest are as a matter of fact identical with the seborrhœa sicca of authors.

The treatment is by stimulating rather than by soothing applications. Lotions may be applied containing salicylic acid and dilute alcohol, half of one drachm to one drachm to the pint, followed by sulphur ointments, one scruple to one drachm to the ounce of salve basis, or the mercurial ointments (calomel, the yellow oxide of mercury, or white precipitate), in the strength of five to ten grains to the ounce of vaseline. To these may often be added with advantage one of the

tars, especially the oil of white birch in the strength of ten to twenty minims to the ounce. Shampooings with green soap are needed in all obstinate cases. There are, however, mild forms of the disease which yield with readiness to lime-water and zinc oxide lotions followed by a mild sulphur ointment.

Eczema of the Tropics.

("Prickly Heat"); Eczema Solare, Lichen Tropicus.

Severe types of eczema are often produced by exposure to the excessive temperatures of summer in the northern latitudes, as well as in tropical countries. These affections usually begin with excessive sweating followed by hyperæmia of the orifices of the coil-ducts, by the production of minute reddish papules diffused over the surface of the skin, and finally, as the result of pruritus and scratching, by the occurrence of eczema. Infants, children, and individuals especially obese or much given to the use of alcoholic stimulants in hot weather, are particularly apt to suffer. At times the affection assumes the phases of an intertrigo; again, the entire body covered by the clothing becomes the seat of numerous, closely packed, minute, acuminate, and vividly red papules or vesico-papules, which are productive of excessive itching.

The disorder is to be treated by starch, bran, oatmeal, or alkaline baths with exclusion of soap, and the use afterwards of dusting powders such as talc, the Anderson powder, starch and boric acid, or lycopodium. For localized patches where the symptoms are unusually severe, lime-water lotions may be employed, occasionally with the addition of bland oils. Unguents are rarely grateful till the acuity of the symptoms is relieved, when the soothing salves (cold cream, cucumber, or boracic-acid unguent of Lister) may be employed.

Universal Eczema.

This affection requires as a rule confinement to the bed, and the use of such salves, lotions, etc., as may be applied with the greatest freedom without danger of absorption of a noxious medicament from the cutaneous surface.

The treatment is to be pursued by the simpler methods. Emollient baths are to be followed for the most part by the use of dusting powders over the general surface where the inflammation is diffused, substituting for these soothing salves, especially the diachylon, when complaint is made of the "drying" effect of the powders. It should always be remembered in treating universal eczema, that no one method is applicable in general to the entire surface; one remedy

may be required for the lids and scalp, another for the cheeks and lips, yet another for the vulva, scrotum, or hand. In all cases of universal eczema, care should be had to distinguish the affection from pityriasis rubra pilaris, pemphigus foliaceus, and desquamative scarlatiniform erythema. In this group of generalized dermatoses there is a common element of uniformity of symptoms in all portions of the body; while in eczema the crusted condition of one part, the weeping state of another, the especially pruritic surface in another, and the dry papules in an indefinitely outlined patch in another—in brief the pleomorphic character of the affection—stamps it with an unmistakable impress.

Eczema in Infants.

The skin of the newly born child in consequence of its tenderness is peculiarly susceptible to all externally operating adverse factors of disease. Not long after birth digestive disturbances frequently occur which are reflected to the surface, and at a still later period dentition furnishes a crisis whose disorders are often reproduced in the skin. It is not rare with the eruption of each new tooth to discover an aggravation of a preëxisting eczema of the face by the appearance of inflammatory disks on the cheek.

Stress is laid by many authors upon the occurrence of eczema in infants in consequence of a "scrofulous taint" and also because of a supposed inherited tendency to the disease. It is a fact, however, of striking significance that the severest types of eczema are often encountered in infants of parents who enjoy the best social and hygienic conditions, while those infants who are found in public charities and who suffer to an extraordinary extent from disorders of malnutrition and of inheritance, very rarely exhibit typical illustrations of eczema of the head. As a matter of fact the fleshy and over-fed baby at the breast will often suffer from an eczema more than the child of another family who is perishing from a wasting disorder.

Care should be taken to exclude syphilis in all cases where a supposed eczema is lingering about the angles of the mouth and of the nostrils, especially when the patches have a distinctly circumscribed and circular outline, and when there is coexistence of "snuffles." The same is true of patches of eczema recognized about the anus where tubercles or flat papules form. The significance of malnutrition is always accentuated in these cases, the patients being often puny and withered starvelings.

The typically eczematous infant presents always pictures of the moist variety of the disease, crusts upon the scalp, vesicles and pustules upon the cheeks and about the neck, erythematous and irregu-

larly defined patches about the flexures of the joints, and a constant tendency to moistening and crusting wherever the disease lingers.

The treatment of the infant affected with eczema should always be of the simplest kind. The most important matter is the regulation of the food, which includes also a careful study of the dietary of the nursing mother. Alcohol in every form should be forbidden the nursing woman when her infant is both fleshy and eczematous. The food also should be provided in such a way as to exclude many of the nitrogenous articles. In infants not at the breast, the food should often be restricted to carefully selected articles. A miscellaneous diet is objectionable. In infants within the first year, the food should consist of milk with large exclusion of the proprietary preparations which are sold by the chemists. After the seventh month a small cup may be given daily of chicken or beef broth. Constipation in all cases should be relieved. No medicament is more useful in this event than calomel, by the proper administration of which the internal treatment of eczema may be much simplified. The physician must decide between giving the smaller doses gr. $\frac{1}{20}$–$\frac{1}{10}$ rubbed up with two grains of bicarbonate of sodium and sugar of milk, twice or more often in the day, or the administration at properly regulated intervals of a larger dose, for example one to two grains of calomel with three of rhubarb and calcined magnesia. Iron is recommended by many authors, but is seldom required in eczema when the diet is properly regulated and the secretions are normally furnished.

In the external treatment of eczema in these young subjects, the simple dusting powders and lotions are always to be preferred to the more stimulating applications. As a rule soap should be excluded, and the emollient or alkaline baths used when required. The customary daily bath of the infant by immersion in a tub, usually should be omitted during an attack of eczema, save when the head alone is affected. In the latter event the rest of the body may be sponged daily and the skin afterwards gently rubbed with the hand of the mother. As a rule tar should be excluded in the management of infantile eczema, and ointments when employed should also be of the soothing sort already described (Lassar, diachylon, bismuth oleate). In persons who live at a distance from the seashore, great advantage is gained by the removal of the infant to a region which is near the seaboard. The modification of the air by proximity to the sea is of special advantage in the case of these tender subjects of disease. Even the occupation of steam-heated apartments in the midst of a rigorous winter does not save the child from aggravation of the disease of a severe type, as often as there is a decided lowering of the atmospheric temperature.

DERMATITIS.

Dermatitis is an inflammation of the skin characterized by the occurrence of heat, redness, and infiltration, terminating either by resolution or by destruction of the tissue through gangrene. The term dermatitis relates technically to a group of dermatoses which are characterized by the usual phenomena of inflammation of the skin. The title, however, has been given by many authors a conventional meaning, and is employed to-day, with a descriptive title or phrase attached, to designate a series of disorders, some of which are widely different from others, and in many of which the phenomena of inflammation of the skin are much less significant than other symptoms present. In these pages will be considered, first, those affections to which the title dermatitis is most appropriately limited; and, later, the group of disorders to which the term dermatitis is applied chiefly as a convention. With respect to the former class, it is to be remarked that the widest divergence exists between them in point of severity; the milder grades spontaneously disappear without leaving relics of the process; the severer not rarely terminate in destruction of the bodily tissues and in death as a result of shock or of exhaustion. The most common causes of this group of inflammations are those which are most inimical to the general health of the body, viz., mechanical injury, excessive heat and cold, and poisons either ingested or externally applied.

Dermatitis Traumatica.

The inflammations of the skin produced by mechanical injury, and resulting in erosion, abrasion, contusion, compression, concussion, puncture, incision, or laceration are of common occurrence. When produced by scratching in order to relieve itching of the skin the resulting excoriations, torn papules, and scratch-marks are the varieties of traumatic dermatitis coming chiefly under the observation of the dermatologist. Every grade of inflammation of the skin is thus produced, from the slightest erythema to a phlegmonous inflammation which may go on to the production of pus upon the surface or within the injured tissue (abscess), or to a condition in which a greater or less area of the skin falls into necrosis.

Dermatitis Venenata.

This term is used to designate the disorders of the skin produced by chemical, caustic, or other irritants of that character, applied externally, as distinguished from dermatitis medicamentosa which

relates to those eruptions upon the skin produced exclusively by the ingestion of medicaments.

Chief among the dermatoses produced by externally operating agents is the eruption produced by the poison ivy (rhus venenata), and poison oak (rhus toxicodendron). The first named of these is a plant more commonly seen in America than elsewhere; sometimes seeking support, and at other times rising from the ground, rarely to a height exceeding two or three feet. It is readily distinguished by its trifoliate leaflets which are alternate and not opposite, smooth, shining, somewhat hairy, and ovate or rhomboidal in outline. This plant is readily distinguished from the Virginia creeper (ampelopsis quinquefolia) with which it is apt to be confounded, by the fact that in the last-named plant there are five leaves on the stalk, which differ also considerably in shape from those of the poison ivy.

The oak is rarer, growing usually in swamps, where it resembles a young tree; the trunk is several inches in diameter and produces pinnate leaves with one-half dozen and more leaflets attached to each. The plant strongly resembles the elder and sumac, which, however, have leaves with serrated edges and pointed tips. At one time it was thought by Maisch and others that the poison of these plants was due to toxicodendric acid, and that this acid might be corrected after its damage was wrought, by application of an alkali to the surface. This, however, has been shown to be erroneous.

There seems to be little question but that individuals differ respecting their sensitiveness to this source of disease. Botanists have been known to suffer after handling the dried plants years after their collection. Other individuals are reported to suffer even when not in contact but simply approximated within a few feet of the plant, especially when in flower. Yet others are known to handle the leaves and flowers with impunity.

The disease comes on within some hours after exposure with a sensation of heat and itching experienced in the face and hands chiefly, because these parts commonly have been exposed to the poison when the subject has been engaged in botanizing or handling plants. When the hands are brought to the covered regions of the body (the ano-genital region for example) these parts also suffer and in the same way. The affected surfaces become rapidly reddened, tumefied, the seat of active vesiculation, and of the exudation of a clear serous fluid which drips from the surface and dries into thin crusts. The features of the face may be so swollen as to be scarcely distinguishable, and the resulting œdema in any portion of the body attacked may be excessive. In extreme cases the disorder spreads more or less rapidly from the regions primarily invaded to others, though it is rarely gen-

eralized. As the process is essentially an acute one, it is usually terminated within a few days. The chronic cases reported are presumably those simply in which the rhus poisoning has induced in a susceptible patient an eczema which later persisted.

Professor White, in his treatise on "Dermatitis Venenata," mentions a series of plants found in this country and abroad which, usually in less degree than the poison ivy, are also capable of exciting inflammation of the skin. Among them may be named mezereon, the nettle, cinchona and its alkaloids, fleabane, burdock, euphorbia, skunk-cabbage, Indian turnip, cowhage, smart-weed, poke, ipecac, balm of Gilead, catalpa, some varieties of arnica, bayberry, clematis, wood anemone, cashew-nut, and bitter orange. The articles employed in Japan for the purpose of producing the highly finished lacquer work for which that country is famous, have been known to produce the same effect.

Other forms of dermatitis venenata are produced by such chemical agents as croton oil, cantharides, mustard, tartar emetic, almost all the strong acids and alkalies, turpentine, chloroform, ether, many members of the tar family, sea-salt, bichromate of potassium, chrysarobin, and almost the entire list of dyes derived from aniline, picric acid, iodoform, carbolic acid, and the mercurials, especially the bichloride of mercury.

A number of irritants from the animal kingdom produce a poisonous effect when in contact with the skin, including jelly-fish and sea urchins, lice, bedbugs, wasps, mosquitoes, gnats, and the bites and wounds of a number of reptiles.

Among the common sources of these accidents in domestic life may be named the use of cheap soaps, contact with arsenical wall-paper, dyed materials of all sorts worn next to the skin, and the paints of toys applied by children to the lips.

The treatment of dermatitis venenata is that which is appropriate to the corresponding stage of acute eczema. The cooling lotions are always indicated, as for example zinc oxide and lime water, one drachm to eight ounces; or one-half pint each of lime-water and elder-flower water shaken up with one drachm each of zinc oxide and subnitrate of bismuth, with half a fluidrachm of dilute hydrocyanic acid. For this may be substituted the liquor plumbi subacetatis dilutus, one-half of one ounce to the pint of water with the addition of from one-half to one drachm of glycerin. It is usually comforting to apply to the surface soft rags moistened with these lotions and to keep them in contact with the part. The diluted "black wash" may be similarly employed, or, as recommended by Duhring, from two to four drachms of the fluid extract of grindelia robusta to the

pint of rose-water or the decoction of white-oak bark. After these applications, it is always desirable to employ the dusting powders, of which the simplest are the best, such as for example borated starch powder one part to ten; or the Anderson powder; or compounds of zinc oxide, talc, starch, magnesia, or lycopodium, as suggested to the mind of the physician. When the acuity of the symptoms is relieved, the simpler ointments may be employed, such as the Lassar paste, the cucumber ointment, Lister's boric-acid salve, or freshly made benzoinated zinc oxide salve reduced one-half with cold cream.

Dermatitis Medicamentosa.

(Drug Eruptions.)

Under this title are included the several eruptive symptoms induced by the ingestion, as contrasted with the external application, of medicaments. The eruptive symptoms in these cases may result either from the elimination of a toxic agent through the emunctories of the skin, or by reflex action aroused by the irritative effects of the drug upon the mucous surface of the alimentary canal. A certain degree of idiosyncrasy may be suspected to exist in the subject of these exanthemata, seeing that the larger number of all drugs set down in the list as capable of inducing rashes, may be administered in suitable doses to the majority of men and women without inducing a medicamentous exanthem. It is by no means necessary that large doses should be employed for the production of the effect, since even small doses in susceptible persons have often evoked the most violent resentment in the skin while, after tolerance has been established, doses considerably larger have been employed without appreciable results.

For purposes of diagnosis it might have been satisfactory if every drug capable of producing a medicamentous dermatitis always excited the same eruption and that wholly different from those elicited by every other article in the list. This, however, is far from being the case. The medicamentous rashes with respect to lesions are readily grouped in a small category, being as a rule characterized by the speedy occurrence of vesicles, pustules, furuncles, abscesses, papules, wheals, bullæ, purpuric stainings, erythematous patches, scaling, pigmentation, or cyanotic symptoms. Usually symmetrical of distribution, these eruptions are accompanied as a rule by pruritic, tingling, burning, or painful sensations, and disappear speedily on suspension of the medication. In some cases persistence in the administration of the drug exciting the disease, is followed by aggravation of the eruption first produced, this aggravation being progressively heightened

when larger and still larger doses are exhibited; but this is rather the exception than the rule. For the most part the symptoms continue either unabated or without marked aggravation after the onset, if the dose be pushed; or tolerance is established and either the specific effect is not induced or other symptoms are substituted for the cutaneous, such as gastric distress, abdominal pain, bowel looseness, etc. In some cases the eyes, throat, and mucous membranes in general, exhibit symptoms of irritation when the skin is attacked.

Viewing comprehensively the group of drugs capable of exciting these rashes, it will be noted that a wide difference exists between cause and effect. Some, as for example the iodine and bromine compounds in different instances, produce a rash of some kind in perhaps the majority of all persons swallowing the dose; while other drugs such as quinine and copaiba are capable of affecting only one person perhaps in a hundred or in a thousand of those to whom the remedy is administered. Again, in a few cases a single drug, such as antipyrin or quinine, is capable of producing several widely dissimilar rashes; while others, such as belladonna and santonin, are reported as productive of an exanthem of but a single type.

It should further be remembered, in studying the medicamentous rashes, that often it is not so much the drug itself as the special condition of the stomach of the patient to whom the drug is administered, that is responsible for the result. In this way are to be explained the reported cases in which a medicament administered at one time with the result of producing a rash, at another wholly fails to have such an effect.

In the following list are included most of the medicaments and other substances of chemical composition or of animal origin known to be capable of producing drug eruptions. Several of the articles named have been recognized as exerting such an effect but once, the observation having been made by but a single author, on one occasion.

Acids:
- benzoic,
- boric,
- carbolic,
- nitric,
- salicylic,
- tannic,

Acetanilid (antifebrin),
Aconite,
Anacardium,
Antimony,
Antipyrin,
Arnica,
Arsenic,
Belladonna and atropine,
Bitter almonds,
Bromine and its compounds,
Calcium (calx sulphurata),
Cannabis indica,
Cantharides,
Capsicum,
Castor oil,

Chinolin,
Chloral (chloralamide),
Chlorate of potash,
Chloroform,
Cinchona and its alkaloids,
Cod-liver oil,
Condurango,
Conium,
Copaiba, cubebs, and oil of sandalwood,
Digitalis,
Dulcamara,
Ergot,
Guaiacum,
Guarana,
Gurjun oil,
Hyoscyamus,
Iodine and its compounds,
Iodoform,
Ipecacuanha,
Iron iodide,
Jaborandi and pilocarpine,
Kava-kava,
Lead (acetate and carbonate),
Matico,
Mercury,
Nux vomica and strychnine,
Opium and its alkaloids,
Phenacetin,
Phosphorus and phosphoric acid,
Pimpinella,
Podophyllum,
Potash bichromate,
Rhubarb,
Santonin,
Silver nitrate,
Stramonium,
Sulphonal,
Sulphur,
Tanacetum,
Tannin,
Tar (oil of cade),
Thapsia,
Tuberculin,
Turpentine, terebene,
Valerian,
Veratrum viride.

A few titles only in this list require special explanation:

Antipyrin.—Numerous instances of medicamentous rashes have been observed since the antipyretic properties of this chemical compound have been recognized and its use has become general. They are, however, less common at present than formerly, as antipyrin to an extent has been superseded lately by other articles of the same class. Most of the eruptive symptoms which it has produced have been studied in wards where patients suffering from typhoid fever were under observation and treatment.

The eruption occurs as a mottled or marbled papulo-erythematous rash, somewhat resembling measles and often occurring with sweating, the last symptom being in many cases without question due to the febrile process for which the remedy was administered. Wheals and bullæ are noted as exceptional forms of the rash. It is commonly symmetrical, rarely general, affecting by preference the flexor surfaces of the limbs, though the palms and soles have been involved. There is usually moderate pruritus and occasionally fine desquamation.

Arsenic.—The arsenical rashes are by no means rare and are often accompanied by symptoms involving the mucous surfaces, such as conjunctival injection. The lesions are chiefly of erythematous type, but wheals, papules, vesicles (resembling those seen in zoster), pustules, furuncles, abscesses, ulcers, and even gangrene, have been reported as resulting. The pigmentation of the skin following the administration of arsenic in full doses, is not rarely observed in neurological clinics where large quantities of the metal are often exhibited in the treatment of nervous diseases, the same effect being often seen by the dermatologist after relief of psoriasis, where large doses of arsenious acid have been employed. The effect in these cases is displayed in the production, both in adults and children, of a dirty yellowish or chocolate-and-milk tinted, rather uniform discoloration, visible chiefly on the upper portions of the covered body but also upon the face. Crocker states that the eruption at the outset is well seen on the belly where white dots first appear on a dark background, the hair-follicles escaping. Though I have studied the eruption in many cases I have never been able to recognize this feature. Itching is usually produced in most of the arsenical rashes. The common combinations of iron and arsenic are capable of producing these effects equally with the administration of pure arsenious acid or of Fowler's or Pearson's solution.

Belladonna.—The erythematous or scarlatiniform redness produced after administration of belladonna and atropine (even after instillation of atropine for the purpose of dilating the pupil) is familiar to most practitioners. The rash is rarely generalized but is most commonly developed over the face and neck. The patches of redness are rather well defined and as a rule disappear on pressure with the finger. The diagnosis is chiefly from scarlatina, which is to be readily recognized by its febrile phenomena, by the special avoidance of the face by the eruption, occurring as it does for the most part below the line of the jaws, by the throat symptoms, and by the characteristic strawberry appearance of the tongue.

Bromine and its Compounds.—The rashes classified under this title are for the most part produced by the bromide of potassium. This remedy is not rarely administered to infants who are feverish, teething, restless, or suffering from an eczema, the physician selecting the bromide salt in preference to one of the opiates. The same toxic effects, however, are produced in adults who are susceptible to the action of the drug, especially in those who are weak or cachectic.

The eruptive symptoms are pustular, furuncular, erythematous, urticarial, bullous, squamous, papular, and seborrhœic. The larger number of all the bromide rashes are of pustular type or begin as

such. They are usually discrete, rarely confluent, and are situated for the most part on the upper segment of the body (head, shoulders, neck), though they occur, especially in the case of infants and children, in abundance upon the extremities. The lesions vary in size from a pinhead to that of a pea; they may be crusted; very rarely indeed after involution they leave scars. In rare instances bullæ form, some filled with a bloody serum. This accident is practically limited to the cachectic. The lesions are probably reflex in origin rather than due, as are the furuncular and pustular eruptions, to the direct action of the drug as a toxicant of the tissues.

One of the most interesting and significant of the rashes induced by the bromide of potassium occurs in infants and more rarely in children. The drug in these patients has usually been administered with a view to relief of nervous symptoms; and as these symptoms are urgent in eczema the rash occasionally develops in full evolution upon the eczematous skin, altogether masking or replacing the original dermatosis. When examined, the face, limbs, and even the hands and feet of these little sufferers are seen to be thickly covered with closely aggregated, elevated, and crimson or purple-hued nodules, each of which represents a composite of closely aggregated groups of sero-pustular lesions, the general effect somewhat resembling that of a small kerion. They are usually rather flattish at the summit, soft, semi-fluctuating, and filled with a characteristic inspissated secretion showing but little tendency to exude from the mass. After desiccation has occurred, the crust seems to be made of the entire mass rather than of the separate points of pustulation. When examined at its height the nature of the eruption is exceedingly liable to escape detection by the inexpert, as the closely packed crimson-hued masses are suggestive of some rare and obscure nodular disorder rather than of a simple pustulation of the skin. Other observers besides myself (cf. the debate on this subject at the annual meeting of the American Dermatological Association, in Montreal, September 18th, 1895) have noted the singular continuance of this eruption in young subjects for some time after the discontinuance of the drug, new points of eruption even occurring later. Superficial losses of substance have at times followed the fall of the crusts, but in my experience no scarring has ever resulted, though the stains left after the subsidence of the rash are very conspicuous. When the eruption in infants is confluent, the aspect of the child's face is not altogether unlike that seen in confluent variola, from which it is not difficult to differentiate the bromide eruption by inspection of the lesions.

The simple cooling lotions (dilute liquor plumbi subacetatis, one-

half of one per cent. of a formalin solution, or zinc oxide and lime water) are to be used at first when there is much heat and inflammation, followed by the application of a borated dusting powder, 1: 10 of common starch. Later, the crusts may be removed by washing in warm water containing an alkali, and the surface may be anointed with a paste containing from one-half to two grains of calomel to the ounce of salve basis.

Chloral Hydrate.—Eruptions produced by this drug are rare but require mention chiefly on account of the frequency with which the hydrate of chloral is employed in medicine. The eruption is either diffused, scarlatiniform, and erythematous, or in the form of papules of small size and of vivid hue. Occasionally the mucous membranes participate in the symptoms produced; at times also lividity of the hands ensues, and even ulceration about the matrix of the nail. The rash is best seen, however, in dusky-hued patches over the upper segment of the body (face, neck, chest, and arms) where it produces some itching and at times œdema. Like the belladonna eruption it is supposed to be due to vasomotor paresis.

Copaiba.—The copaiba rash is interesting chiefly because of the well-known fact that the drug is most frequently administered for relief of a venereal disorder (blennorrhagia), and the ensuing eruption is liable to be mistaken by the unwary for a syphilitic macular exanthem. The distinction between the two is, however, rarely difficult.

The copaiba rash occurs with rapidity after ingestion of the drug, and disappears, as a rule promptly, after the discontinuance of the copaiba. It occurs upon the trunk, abdomen, and extremities. I have occasionally seen it generalized. The lesions are vividly red or dusky hued, fairly defined patches usually closely aggregated, in which event the definition is exceedingly indistinct. In one of my cases the eruption occurred in the form of pinhead-sized, mulberry-hued petechiæ. The pruritic sensations are commonly distressing. Vesicles and bullæ have also been reported as sequences of the administration of the remedy.

Iodine and its Compounds.—It has been said of iodine and its compounds that the rashes they are capable of inducing in the skin simulate those observed in every other dermatosis. There is no group of medicaments which is so often responsible for a cutaneous exanthem and none in which the results are so dissimilar and severe. The eruptions resulting may be erythematous, papular, vesicular, pustular, furuncular, purpuric, vesicular, bullous, urticarial, or nodular. The salt most often responsible for this list of eruptive phenomena is the iodide of potassium; and as this remedy is commonly pre-

scribed for relief of syphilis, it follows that in practice the eruptive symptoms induced are often seen commingled with syphilodermata and even mistaken for the latter by occurrence either before or after the evolution of a specific exanthem.

The most common of the eruptive symptoms induced are papulo-pustular lesions usually discrete, rarely confluent, seen on the face, neck, shoulders, and upper extremities. The eruptions on the face remarkably resemble the lesions of papulo-pustular acne, even to the formation of the nodular "bumps" of which complaint is made when these are spreading over the back. Unfortunately the remedy is at times administered for relief of acne, either by physicians or in the so-called "blood-purifying remedies" sold in the shops, under the erroneous impression that the iodide of potassium is efficacious in such a disorder, and the result in these cases is often in the highest degree unfortunate, the sufferer undergoing a decided aggravation of the acne as a consequence of the toxic lesions induced. It is always wise at the outset of all treatment of severe pustular acne to discover whether such mischievous practice has been instituted previously.

In other cases, especially in infants and children but also in the anæmic and the cachectic, odd-looking papillomatous and vegetating masses are produced, not unlike the kerion-resembling nodes seen in the same class of patients after administration of the bromide of potassium. It is not rare that the two drugs are employed in combination, with the result of the production of exceedingly capricious phenomena. Tilbury Fox was early in describing and figuring this singular eruption, which has since been frequently noted by other authors, and has been made the subject of two papers by myself. At times a suggestive resemblance exists between these elevated masses and condylomata, as the summit is often flattened and the secretion is nearly the same in quantity as that furnished by syphilitic lesions. As contrasted with the similar anthracoid elevations following the bromide of potassium, the striking crimson quality seen in the latter is usually wanting in the iodic rash.

Bumstead, T. Fox, Crocker, Duckworth, O'Reilly, Lindsay, Hutchinson, myself, and several others, have published descriptions of the bullous exanthem following the ingestion of the iodide of potassium. These cases are rare. Vesicular lesions are often commingled with the blebs. The bullæ may begin as papules or be interspersed with the latter. The blebs may coalesce, especially in the asthenic class of subjects. Cardiac and renal complications may occur. Hutchinson's "iodic hydroa" belongs to the same category.

The erythematous rash induced by the iodide of potassium is also among its rarer manifestations. I have seen a few cases illustrating

this effect, one of which was highly significant, broad belts of scarlatiniform redness fairly well defined, sweeping over the shoulders and the outer face of the thigh. Other cases are recorded by Crocker and Rugg. Papules, erythemata, elevations resembling lesions of erythema nodosum, and glottic œdema are also recorded. With any of the really severe manifestations of drug eruptions following the administration of iodide of potassium, other symptoms of iodism are usually present, such as coryza, injection of the conjunctiva, and catarrhal discharges from the eyes, the nose, etc.

The purpuric rash resulting from ingestion of the iodide of potassium has been noted by several observers, and by myself in about a score of well-marked cases. In the majority the rash occurs only on the lower extremities and then in patients of middle life or in those who have been debilitated. Many of the subjects are veterans of syphilis who have previously ingested the iodide of potassium with impunity, and have suddenly been affected with this unusual result on account of a temporary predisposition to the toxic effects. In a patient presented at my clinic while these pages have been in preparation, the purpuric lesions developed simultaneously on the two legs and thighs and on the right upper extremity; and I have seen a few cases in Paris where the upper extremities coincidently with the lower were similarly involved. Hæmoptysis, menorrhagia, and symptoms of hæmophilia have coexisted.

One of the severe types of intoxication which may be present, with or without an iodic exanthem and catarrhal signs of iodism, is represented by a group of symptoms strikingly resembling those characteristic of peritonitis. There is tumefaction of the abdomen, exquisite tenderness, constipation, pain, and a febrile reaction. The symptoms usually disappear after discontinuance of the drug.

A review of the unusual and severe manifestations of iodic intoxication in the skin clearly indicates that the susceptible individuals in these special cases are those who have been debilitated by some cause other than the drug, a cause which has usually produced symptoms preceding the exanthem and for relief of which the iodide was administered. The treatment of all these cases is by suspension of the iodide and the administration of gentle laxatives. Locally the dusting powders usually suffice. The sulphur salves may be usefully employed in the facial, pustular, and acneiform lesions which the ingestion of the remedy has produced.

Opium and its Alkaloids.—Opium, and morphine in particular, after ingestion may produce erythematous, scarlatiniform, morbilliform, vesicular, papular, or even bullous lesions supposed to be due to the drug employed. There is usually well-marked pruritus.

The most of these rashes are probably etiologically related to the profuse sudation which the opiate frequently excites.

Quinine.—Cinchona and its alkaloids, especially quinine, are responsible in rare cases for the production of an exanthem, but considering the very large employment of these preparations with impunity in every part of the civilized world, it must be admitted that in proportion to the number of individuals ingesting the remedy, the rash produced must be one of the rarest in the list. Erythema, wheals, vesicles, bullæ, and purpuric lesions have all been recognized. Only the erythematous and urticarial types have fallen under my observation. The pruritus is usually severe; and desquamation ensues in a larger proportion than in most of the rashes due to drug ingestion. Gangrene has followed in extreme cases (Schuppert). That the power of the drug to produce the rash is not always exerted was well shown in a patient under my observation who had repeated attacks after ingestion of small doses of the sulphate of quinine and who, in attempting to produce the rash on a last occasion for the purpose of exhibiting the same before my clinic, utterly failed of his purpose.

It seems clear that in most of these cases also, the susceptible subjects are suffering from an obscure or recognizable disorder which is in part responsible for the rash.

Tuberculin.—Crocker reports a scarlatiniform rash following the hypodermatic injection of tuberculin. The eruption was a diffused or morbilliform erythema with pinpoint-sized papules about the hair-follicles.

Dermatitis Calorica.

This term includes the inflammations of the skin induced by extremes of thermal influence. The action of heat and of excessive cold upon the surface of the body is practically the same, as the violence of the resulting inflammation in each case is proportioned to the intensity of the degree of temperature which has operated as the exciting cause. Some allowance has, however, to be made in estimating the result, both for the amount of bodily surface exposed and for the medium through which the temperature effect has been exerted. There are hence two opposite conditions to be considered in this connection, ambustio and congelatio.

Ambustio.

(Dermatitis ambustionis; Combustio; Burns of the Skin.)

In this condition the surface of the body has been subjected to a temperature abnormally high and the result is conditioned upon

the degree of elevation of the temperature, upon the character of the medium through which its effect is exerted, upon the extent of surface subjected to the action of heat, and upon the length of time during which such action is continued. For convenience of classification burns are divided into three grades. In the first, an erythematous redness is produced, usually defined at its border by the outlines of the area exposed to the source of heat. The skin is slightly tumefied and becomes the source of a sensation of burning heat rather than of itching. The redness at first subsides under pressure of the finger but later persists. When in course of involution, the skin usually desquamates and for some time after is the seat of a dirty-brownish stain which eventually disappears. This is the common result of exposure for several hours of the day to the rays of the sun, especially when the latter are reflected from the surface of water (erythema solare, eczema solare, "sunburn"), or of exposure of portions of the skin for a shorter time to radiating sources of heat, or to heated solids and fluids somewhat below the temperature of ebullition.

In a second well-defined grade the exposure may be of longer duration, the medium of the heat of higher temperature and yet insufficient to destroy the texture of the integument. In this grade, either speedily or within a few hours after exposure, the skin becomes the seat of vesicles rapidly transformed into bullæ, few or numerous, discrete or coalescent, so that giant elevations of the epidermis result, filled with a translucent serum and covering as large an area as the surface of an entire limb. When examined, it is usual to discover that many of these fluid-containing lesions have ruptured and the shreds and tags of the former roof-wall of blebs are visible over the surface, while elsewhere tense, limpid or yellowish-hued blebs rise from the surface. When these are punctured the serum flows freely from the surface, not merely that originally contained within the chamber but also that furnished by the deeper portions of the exposed epidermis.

When examined in section, it is clear that the blebs are histologically identical with those seen in zoster, pemphigus, and other affections characterized by the formation of bullæ. The superior portion of the corium is distended with fluid (in papillæ, vessels, and connective-tissue elements), the prickle cells are swollen and juicy, or stretched in threads uniting the roof wall with the floor of the chamber. In the spaces thus formed are imprisoned exudation cells, torn epithelia, and serous fluid (Kaposi, Biesiadecki, Haight).

The process terminates either by the free production of pus on the exposed surface, by crusting, or by the slow repair of a granulat-

ing surface which at first represents a sodden rete overlaid with a peculiar plastic layer of succulent cells interspersed with hemorrhagic puncta and circumscribed areas of suppuration. Scarring may result in the severe types of this grade of burn, but as a rule the process is superficial and does not involve destruction of the underlying corium. The pain is severe; fever often accompanies the inflammatory process; and the shock may be dangerous. The complications are lymphangitis, erysipelas, septicæmia, adenopathy, and in neurotic subjects, a long list of nervous accidents following the healing of the burn, the patients, it may be for a year or more after the injury, becoming progressively unable to use an injured limb without pain.

In a third and severest grade of ambustio the intensity of the heat, whether exerted directly or through media, produces a destructive effect upon the skin which falls into gangrene, being at first brownish or blackish, leathery and insensitive. At other times instead of assuming a "carbonized" it presents a "marbleized" appearance, being of a dead-whitish hue, the blood and lymph currents being checked and the resulting condition is similar to that observed in œdema neonatorum. In yet other cases the skin presents the features of boiled flesh. Here and there over the surface bullæ may indicate that the violence of the burn in such regions was less severe than in those where the tissue was completely destroyed. In the course of from two to four days a characteristic ring of demarcation indicates with tolerable clearness the limits of the injury, suppuration ensues, and the slough is cast off by the usual processes of granulation with eventual formation of scar tissue. In some cases the system proves itself incapable of furnishing a scar for burns of this grade having a wide area, and the resources of science are needed to complete the covering of the part with new epidermis.

Consideration of the size of the area attacked is of the highest importance in estimation of the degree of injury produced, whether local or general. The great danger of severe burns is popularly appreciated. When from one-third to one-half of the entire bodily surface is injured, death is likely to ensue. In any case of gravity there may be suppression of the urine, delirium, coma, or a maniacal state; ulceration of the duodenum (oftener after abdominal burns) leading eventually to perforation of the intestine and peritonitis; discharges of blood from stomach, bowel, or bladder (which frequently is found to contain no urine); œdema and congestive inflammation of the mucous lining of the respiratory tract resulting in suffocative symptoms even of gravity sufficient to demand tracheotomy or laryngotomy; and the eventual production of scars. The scars

left by extensive burns are among the most formidable of the deformities requiring the intervention of surgical science. By their contracture the head may be permanently drawn to one side, the lids everted, the mouth distorted, or the fingers and hands flexed or extended to a degree rendering them useless. The scars of burns are more irregular than most others, being seamed, corded, ridged, and often the site of deforming keloid growths.

The pathology of grave cases of ambustio is not completely understood. Kaposi, reviewing the observations of Ponfick, Wertheim, and others who discovered in the blood of the victims of combustion small corpuscles which were supposed to be derived from the shrunken red corpuscles of the blood; and considering also von Lesser's theory of overheating of the corpuscles, and the suggestion that the accident produces retention of excrementitious products, or that there is production of hydrocyanic acid, adheres to the old view that death in these cases results from shock. In other cases, however, there is good reason to believe that the accidents of the reparative process (lymphangitis, etc.) are responsible for the fatal issue.

Prognosis.

The future of a patient affected with a burn is to be formulated according to the several points already enumerated as of importance in this connection, viz., the duration of the exposure, the temperature of the agent inflicting the injury, the area of damaged surface, and the vigor of the subject of the accident. As a rule the milder forms of ambustio are followed by satisfactory recovery, but too much stress cannot be laid upon the fact that peculiarly susceptible subjects (those of the neurotic class, the very young, the very old, and those enfeebled from any cause) may suffer for years from an injury which in another person might have been followed by complete recovery in the course of a few days or weeks. Burns affecting from one-third to one-half or more of the bodily surface are liable to end fatally. With respect to locality, the face (with the accompanying danger of injury to the respiratory tract), the neck, the chest, and the abdomen are regions of more peril when affected with a burn than are the extremities; but the sensitive palms of the hands and soles of the feet are also regions of danger.

Treatment.

The local treatment of burns is of the highest and usually most pressing importance. The simpler accidents of this class are well treated by the application of a sedative lotion, such as lead water,

zinc oxide and lime water, diluted "black wash," oleated lime water, or oil and lime water with elder-flower water each one-third. These lotions should be applied by the aid of soft bits of muslin. The carron oil, one-half each of lime water and olive oil, has long been popularly esteemed for employment in the mild grade of burns. In place of these lotions or after their employment, it is often well to apply the simple or medicated dusting powders. These operate by the exclusion of air from the burned portions of the skin, and thus serve to relieve to a large extent the burning pain.

When the blebs are tense they may be ruptured with a disinfected needle and the serum permitted to escape, after which the surface may be thoroughly dredged with a borated powder. The following methods of treatment for this grade of burn have also been recommended by different authors: For mild cases, painting the parts with collodion or flexible collodion to which has been added three to five per cent. of salicylic acid; lotions of bicarbonate of sodium; powdering with subnitrate of bismuth; boric-acid ointments; carbolized vaseline; lotions of bichloride of mercury 1:2,000; and the protection of dressings by the use externally of oiled silk, of gutta-percha paper, or of the Lister protective. It is to be remembered in all these cases that a chief indication is to relieve the excessive pain, and this end is reached generally by the exclusion of air. Five to ten per cent. solutions of the muriate of cocaine have also been employed for this purpose, but in general are objectionable on account of the frequency with which the cocaine habit is established after dressings of this class. As the acuity of the symptoms subsides, other external applications may be employed, such as benzoinated oxide-of-zinc ointment; from two to four per cent. solutions of ichthyol; thiol; and the reduced liquor picis alkalinus described in these pages in the chapter on eczema. It should be remembered in making all these dressings, first, that only a small portion of an exposed burn should be exposed to the air at one time; second, that the dressings should not be changed too frequently unless there be pus production beneath the forming crust; third, that all lint or antiseptic cotton applied to the surface when it is discharging should be either moistened or anointed that when changed at the time of dressing, the exquisitely sensitive surface beneath may not be torn by the removal of an adhering material.

In the management of the severer grade of burns, and in particular of all those where life is threatened, no treatment has yet been devised which is superior to that first suggested by Hebra, viz., continuous immersion of the patient in water of a temperature most grateful to the skin. In some of the smaller hospitals of our country where apparatus for this purpose is not expressly provided, I have

succeeded in securing the desired end by the aid of a source of heated water from above supplying an ordinary bath-tub, security being provided for an overflow by rubber tubing. The apparatus employed in Vienna and Paris consists of a metallic bath-tub containing a suitable iron frame with webbing stretching from side to side, the whole suspended by chains passing about two rollers at the head and foot of the tub. By means of a crank and geared wheel the section of this frame designed to accommodate the head and shoulders can be elevated or depressed at will and the part intended for the weight of the body can also be properly adjusted. The mattress with blanket and sheets is laid upon the framework and upon this the patient reclines. He or she remains continuously in the water, night and day, under the supervision of attendants, leaving the bath only for the purpose of evacuating the bowels and the bladder. The temperature is regulated strictly according to the requirements of the patient, being at first as high as from 100 to 110° and gradually lowered until the patient is comfortable at between 85° and 90°. If the case prove fatal, the water-bed supplies all the requirements of euthanasia. If the patient belong to the class in which recovery is possible, the relief is more prompt and with less pain than by any method known to science. The enthusiastic encomium in which Kaposi indulges when considering this subject is fully justified, as I can testify from personal observation, by the satisfactory issue of many cases.

Where continuous immersion cannot be employed in the management of these severe burns, resort must be had to the well-known methods of combating suppuration and the damage resulting from the presence of micro-organisms.

Here boric acid, europhen, iodoform, and formalin (one-tenth to one-half of one per cent.) play an important part. Granulations, when exuberant, require pencilling with nitrate of silver or sulphate of copper, and often compression with aseptic strapping. The fingers, when burned, require to be sedulously guarded against adhesion to each other by the separate wrapping of each digit, and the same precautions are requisite for the toes, the lips, and other burned portions of the skin which are naturally apposed. The resources of surgery (skin-grafting, amputation, forced extension, subcutaneous section, and plastic operations for destroying cicatrices) may be required in serious cases.

CONGELATIO.

(Dermatitis Congelationis; "Frost-Bite.")

Under this title are included all the forms of inflammation of the skin produced by exposure to low temperatures. The indefiniteness

of the chief etiological factor in these cases is due to the circumstance that there are persons peculiarly susceptible to the action of cold who suffer at relatively high temperatures which other persons endure with impunity, while there are temperatures exceedingly low in which the majority of persons will exhibit the severest types of congelation.

Pernio ("*Chilblain*").—The lesions represented by these terms are the milder forms of dermatitis resulting from exposure to cold temperatures and are all of erythematous type. They occur chiefly upon the hands and feet because those regions are most exposed to the action of the cold and most distant from the centre of circulation; but they are exhibited also in other regions, as for example on the temple, on the nose, on the cheeks, on the ears, and on the chin. They occur in the form of irregularly defined small-coin to pullet's-egg-sized patches, slightly elevated above the general level of the surface, with a vivid hue at the periphery, and the purplish aspect of passive congestion at the centre. They are the seat of itching, burning, stinging, and other painful sensations, usually aggravated by warmth, and are often quite sensitive to pressure. They are strikingly different from all the strictly defined inflammations of the skin, in that the surface on which they are displayed is usually cold rather than hot, and on the whole insensitive. They all represent an indolent reaction against the cold, which at first produces contraction of the blood-vessels supplying the part and afterwards a passive rather than an active congestion. In some cases there is, however, an inflammatory reaction and even an exudate, consisting of a serous or sero-hemorrhagic fluid distending a blister. Usually in these cases there have been pressure effects as well as exposure to cold, the perniones occurring on the feet where the wearing of the shoe or boot has been productive of damage, as for example in the case of soldiers making a forced march through snow and ice.

Hutchinson, and with him some of the English dermatologists, have described as chilblains, lesions which I have denominated as lupus erythematosus of the hands (*American Journal of Cutaneous and Venereal Diseases*, Vol. II., page 321), and which begin with a persistent erythematous blotch. But in the case of lupus erythematosus there is usually a typical scar left after the occurrence of involution; and even before such an event there is a crusting of the surface which points significantly to some other process than a passive hyperæmia. The lupoid patches further persist through all varieties of weather and are not the seat of the annoying subjective sensations produced by the perniones. It is noticeable that these accidents are apt to occur in individuals who have a feeble or strumous constitution and in persons who have not yet reached adult years.

The treatment of these erythematous grades of congelatio should be by stimulating applications which tend to restore the activity of the circulation to the part. Tincture of iodine reduced one-half in strength; one part of aqua ammoniæ and two to three parts of the reduced tincture of iodine; iodized glycerin; dilute acetic or nitric acid; the tincture of camphor; and ointments of iodine, boric acid, and tar have all proved useful. The camphorated soap liniments and lotions containing sodium bicarbonate are also highly esteemed.

In anæmic and debilitated patients of both sexes internal treatment often will be required. For this purpose the ferruginous tonics, cod-liver oil, and a generous diet usually are indicated. In the way of prevention, Crocker advises the wearing of warm coverings for the feet; but care should always be had to avoid the wearing of woollen stockings and fur-lined gloves. The former especially induce sweating of the feet; and the foot which is bathed with moisture in cold weather is chilled rapidly. There is no better method of prevention than firstly insuring a proper amount of daily outdoor exercise by walking; second, by the chafing of the feet until they are warmed whenever the stocking or sock is removed; third, by dusting the foot and the interdigital spaces with boric or salicylic acid to insure dryness of the surface.

In the case of erythematous congelatio of more rapid occurrence, as for example when portions of the face or extremities are frost-bitten, the surface turns a dead-white color and loses sensation. When the circulation is restored, the part rapidly becomes tumefied and of an intense crimson hue, with peculiarly tingling and pricking sensations until the circulation is restored wholly. When the grade is somewhat severer, vesiculation may occur, and even after repair has been completed the part may be left for months or years to come unusually sensitive to the action of cold.

In the management of these cases the effort has to be made to restore the circulation gradually rather than rapidly in order to prevent the subsequent occurrence of an intense grade of inflammation. With this end in view the patient is kept away from all sources of radiant heat, and the parts are rubbed gently with snow or iced water until the circulation very gradually is restored and the subject of frost-bite is enabled to enter a warmed apartment or to warm the general surface of the body before a fire.

In the *second grade of congelatio*, the erythematous or bullous stage is succeeded by ulceration, the lesions in this event requiring treatment by stimulating ointments and plasters after the application of nitrate of silver in stick or solution, or the brushing of the surface with weak solutions of carbolic acid or with the tincture of benzoin.

In the *third grade of congelatio*, the damage is proportioned to the severity of the cold to which the part has been subjected. In these conditions the skin at first presents the well-known marbleized appearance; the circulation ceases in the blood and lymph channels; there is no sweat secreted; the part is cold to the touch, insensitive, stiffened, and occasionally veined with bluish streaks or lines. Large bullæ may form, filled with a clear or hemorrhagic serum; and when severe effects are produced, necrosis of the tissue which has been completely frozen follows in the course of a few days, though it may be prolonged for a week or more. Here as in the carbonization of burned flesh, a line of demarcation forms about the part which is to be cast off in the slough, suppuration follows about and beneath the latter, and eventually repair ensues when there has been no surgical intervention, by the ordinary process of granulation and cicatrization. It is somewhat rare, however, that these sloughs in frost-bite, as distinguished from burns, are permitted to be cast off spontaneously, since the heat which produces the injury may be applied to any portion of the body, while the action of severe cold is exerted chiefly upon the extremities, and in particular upon the distal portions of the extremities. It follows that the amputation of fingers, of toes, of feet, and of hands is often required on account of the supervention of gangrene after freezing.

Diagnosis.

The conditions described above can be readily recognized by their obvious symptomatology in most cases. In infants, however, congelatio is to be distinguished from *sclerema neonatorum*, a generalized condition in which the skin becomes tense and waxy and difficult to pit on pressure, with some attachment to the underlying tissue. The jaw is stiff and the joints also are inflexible. In *œdema neonatorum* there is a certain degree of lividity of the skin which can be made to pit on firm pressure and also can be pinched between the thumb and the fingers. The disorder usually begins before the third day of existence and affects chiefly the hands, the legs, and other inferior portions of the body. These points are of chief importance in the examination of abandoned infants who have been exposed to cold.

Prognosis.

The prognosis of the severer forms of congelatio may be grave, since serious mutilation of the feet and hands may follow, and even a fatal result ensue from exposure to the cold. In all the milder forms of frost-bite described above the prognosis is favorable, though it is certain that for persons who have been once affected in this way,

special care must be exercised with respect to subsequent exposures of the body in extremely cold weather.

Treatment.

The treatment of the milder forms of frost-bite has been already considered. The severer forms are to be treated by the surgical measures suitable in all cases of gangrene and the repair of injury after suppuration of sloughs.

Feigned Diseases of the Skin.

Eruptive and other symptoms of disease of the skin are occasionally induced artificially, usually by the individuals themselves who exhibit these accidents with different ends in view. In one class may be named persons who hope to benefit by the public exhibition of these disorders for the purpose of soliciting charity. These cases are less common in this country than in Europe, where the practice of professional mendicancy has been elevated to an art. Another class of individuals exhibiting these simulated affections, includes those who hope by this means either to escape punishment or to avoid the performance of duty. To this class belong the malingerers of military encampments and vessels of war, prisoners, and persons anxious to be transferred from one public charity to another. In a third class—which perhaps is the most interesting of all to physicians, since it is that which as a rule awakens the fewest suspicions respecting the nature of these ailments—are hysterical subjects, usually women, who produce eruptions either, first, for the purpose of eliciting the sympathy of their associates; or, second, because they are under the influence of a mental delusion.

All these classes select the skin for the purpose of displaying their artificial disorders, chiefly because it tells its own story when exposed to the eye; and also because the self-inflicted damage is usually not of a sort calculated to do permanent injury to health or to life.

The general characters of eruptions thus produced may commonly be recognized by an expert diagnostician who bears in mind the peculiarities of environment of the individual who is affected. Almost all the eruptions thus produced are definitely outlined. In right-handed patients they are apt to be produced upon the portions of the body most accessible to the right hand—if on the forearm, the left member; if on the leg or thigh, the right member, etc. When a caustic or irritant salt or fluid substance is used, it is often awkwardly applied, so that a liquid is dropped *guttatim* upon the surface below the main site of application, or it flows down forming an acute angle

pointing away from the larger area of injury. In other cases, as for example where the hairs are plucked from the scalp, from the brows, or from the lids, the right side invariably suffers more than the left in a right-handed patient. Most of these eruptions are asymmetrical. All of them are peculiar in that they can usually be made to undergo repair when absolutely protected from the reach of the supposed sufferer (by a plaster case, or by an immovable apparatus); and in that they invariably refuse to get well under a simple and appropriate treatment so long as the patient has access to the region where his injury is inflicted. Lastly, the clothing, the fingers, and the finger-nails of patients employing caustic or dyed materials for the purpose of producing an eruption will usually betray some evidence of the use which has been made of the offending material.

The following illustrative examples may be cited: A girl of eighteen came under my observation who had been suffering from some

FIG. 83.—Factitious Ulcers of the Arm and Forearm.

neuralgic disorder of the left arm, for which she had been treated a number of years by hypodermatic injections of morphine. This course eventually produced a degree of moral obliquity which led her finally to the production of palm-sized ulcers upon the left forearm and upon the anterior face of both legs by the use of nitric acid. She confessed her fault when confronted with a statement of the truth, and admitted that she had produced the sores for the purpose of gaining admission

to a large city hospital. I lately visited a patient in one of the large charities of Chicago in whose case a finger had been amputated for the relief of what was supposed to be a spontaneous gangrene. The process was being repeated in the left forearm, but at the time of my visit repair was in progress as the result of the application of a plaster case enveloping the entire limb. The patient had had both ovaries

FIG. 54.—Factitious Ulcer of the Leg.

removed and was a member of a religious order. She had made use of carbolic acid. The occurrence of feigned eruptions in women of an hysterical class who are also religious devotees is not unusual. Crocker has well written that "spontaneous superficial gangrene, especially in a young woman, should always be regarded with suspicion."

By the use of tartar-emetic ointment, croton oil, tar, and other chemical substances, exceedingly clever imitations may be made of comedones, of sycosis, of scabies, and even of syphilitic lesions. Areas of baldness upon the scalp, as has been already suggested, may be produced not merely by plucking at the hairs with the fingers but by repeated pluckings and pickings of the surface, so that such portions of the scalp may become irritated and the seat of actual hyperæmia. The variously hued sweatings of different portions of the body, and even the occurrence of erythematous patches upon the surface, may be readily simulated by the stains obtained by brightly dyed articles of clothing for the body and for the bed (the red border

of blankets, the hues of clocked stockings, the vividly red-dyed flannel underclothing worn by the poorer classes, etc.). Among the rarer instances of feigned eruptions may be mentioned Bazin's case, in which a girl produced a bullous eruption by introducing cantharides beneath the skin; Stelwagon's case of a nervous girl of nineteen who produced groups of crusted lesions on the forearms by rubbing with the finger ends, the same condition having been produced under the observation of both Fox and Sangster, by rubbing with the finger ends moistened with saliva; and Fagge's case where a young woman produced a pemphigoid eruption by applying nitric acid to the surface of the skin.

Diagnosis.

The chief elements of importance in the establishment of diagnosis relate to the subject of the supposed disease fully as much as to the character of the lesions present. Too much stress cannot be laid upon this point. Young women from fourteen to twenty years of age who are neurotic, who have suffered from neuralgia, who have employed narcotics or stimulants, who are religious devotees, or who have undergone operations upon the generative organs, are the commonest to practise this sort of deception. After these subjects of feigned diseases of the skin may be named prisoners, malingerers, and young men who have attracted the attention of a number of practitioners of medicine and who have served for purpose of an exhibition before medical classes or societies.

When an eruptive symptom is remarkable on account of its rarity, its peculiarity as to location, progress, mode of evolution, or general features, the diagnostician should invariably first turn to the possibility of an artificial origin rather than to that of the occurrence of a rare affection. It is important in the investigation of all such cases that the examination should be completed before any attempt has been made either to formulate an opinion or to extract the truth from the individual who is feigning disease. No little discretion is required on the part of the physician in eliciting the truth in these cases, and even, in the case of some patients, in securing relief of all the symptoms present without subjecting the supposed sufferer to the mortification of a knowledge that the truth has been discovered.

Dermatitis Repens (Crocker).

Under this title Crocker ("Diseases of the Skin," 2d ed., 1893) describes an inflammatory affection of the skin, probably neurotic, affecting for the most part the upper extremities and usually occur-

ring after some injury of the affected part. The brief description which follows is abridged from his account of three cases:

In the first, after amputation of a finger from the hand of a young man, a dermatitis starting in the neighborhood of the cicatrix spread over half the hand and along the fingers. The affected surface was denuded of epidermis as in eczema rubrum, and furnished at several points a serous ooze. The process steadily advanced for months until the surface of the forearm as far as the elbow was involved, after which repair ensued, leaving the skin reddened and tender.

The second case was that of a woman who, for six months before observation, had exhibited on the flexor surface of the wrist reddish papules which coalesced and furnished a secretion. The eruptive symptoms extended upwards over the arm and downwards to the hand, the regions earliest affected first recovering. The margin was well defined and covered with a bulky, dirty-looking crust; in parts, the epidermis was undermined; in yet others, it was reddened and desiccated. In the course of four months the morbid process extended from below the elbow to the middle of the upper arm. In four months more it had extended up the right arm, over the back of the neck, and down the left arm as far as the elbow, the parts first involved meanwhile healing.

The third case was milder, that of a young man who first had blebs form on the wrists, the disease as in the other cases spreading in a year upwards over the arm and downwards to the hand, so that the entire palm and fingers excepting the terminal phalanges were involved. Recovery ensued in the course of three months.

The author reports having observed several similar cases, one in which the sole of the foot was involved. In almost every instance the dermatitis followed a slight injury of the skin (walking barefoot on the sands, running a splinter beneath the nail, an attack of dermatitis calorica, etc.). Crocker believes that the disease begins as a peripheral neuritis after a trivial injury, and that a secondary invasion by parasites is responsible for the later progress of the affection.

I have seen cases much milder than those reported by Crocker which unquestionably are to be classed in the same category. Several originated in the labor which is known in the West as "shucking" or husking corn, the nail falling as the result, first of slight traumatisms produced by the tough fibres of the maize case, and next as the result of serpiginous inflammation spreading about the nail-fold and matrix. In another case a spreading dermatitis followed amputation of a finger and lasted for seven months, the area of inflammation being circumscribed and the skin undermined, but the process was checked before the elbow was reached. In this case the palm,

two remaining digits, and the lower third of the anterior face of the forearm were involved.

Crocker recognizes Nepveu's case (*British Medical Journal*, December 11th, 1886) as belonging to the same category. In this instance a wound of the thumb resulted in the production of a vesicular disease which spread over the entire surface of the body. The vesicles were distended with a serum which contained bacteria.

The diagnosis is to be established by differentiation of the affection from eczema, the distinguishing features of dermatitis repens being the denuded surface, the sharply defined, undermined, and spreading border, and the appearance of the healed surface which is shining and thinned. Palmar syphilodermata are to be carefully excluded.

In the treatment of his patients Crocker was successful only after applying ten-per-cent. permanganate of potassium solutions, painted on three times daily till a crust formed, cutting away the undermined skin before application. Pyoktanin would be well worth applying in similar instances.

Dermatitis Exfoliativa Epidemica.

(Epidemic Exfoliative Dermatitis; Savill's Disease; Epidemic Skin Disease; Epidemic Eczema.)

These titles have been given to a rare disorder, observed only, so far as is now known, in Great Britain, and there chiefly in public institutions for the care of aged and infirm persons of both sexes who are paupers. The disease was first observed in the year 1888 and since then about five hundred cases have been recorded.

The affection first occurs (according to Dr. Savill, who has written the most elaborate description of the disorder) in two types, the one an eczema-form and moist variety; the other dry and suggestive of pityriasis rubra.

The affection begins without definite prodromes, by the exhibition of one or of several elevated maculo-papular plaques with marginate border, thickened and covered with minute firm papules. The seat of the eruption may be the upper extremities, the face and scalp, or the entire surface of the body. The patients were middle-aged or very old people of both sexes, though a few children and young persons were attacked, and some of the nurses. After the complete evolution or even disappearance of the exanthem in this type, relapses occur, the affection becomes symmetrical and generalized, if not such at an earlier date, the surface of a vivid red almost scarlet color, and either dry and desquamative or moist and weeping.

Crocker who saw many of Savill's patients, reports that the exfoliation of epidermis was always abundant and, so far as regards the appearance, the cases were instances of pityriasis rubra.

The systemic symptoms were well-marked in most subjects of the disease, especially in the case of the aged. The tongue became coated and shed its epithelial covering; there were fever, thirst, gastric disturbance, diarrhœa, conjunctivitis, in severe cases complete shedding of the hair and the nails, albuminuria, pneumonia, gangrene of the feet, and in some cases death resulted; though when resolution occurred, the skin slowly resumed its normal appearance after losing its infiltration and deep pigmentation.

The disease was thought by the English observers to be a dermatitis due to an aërobic diplococcus resembling but somewhat differing from the staphylococcus pyogenes albus. Its contagious characters seem to be fully determined, as the disease was found to spread from bed to bed in different wards, and even to be capable of infecting the attendants. Further, it seemed to produce cyclical symptoms, as in many cases it ran its course in from six to eight weeks.

No special method of treatment was found to be effective.

Note.

The title of dermatitis has been technically applied, in whole or in part, also to the following-named affections, each of which is described in other chapters of this treatise: Dermatitis gangrænosa (sphaceloderma); symmetrical gangrene (Raynaud's disease); dermatitis gangrænosa infantum; dermatitis papillaris capillitii (Kaposi), acne keloid of the scalp; dermatitis herpetiformis; dermatitis multiformis (Duhring); dermatitis exfoliativa; and dermatitis exfoliativa neonatorum.

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SQUAMOUS AFFECTIONS.

BY

H. RADCLIFFE CROCKER,

LONDON.

SQUAMOUS AFFECTIONS.

PSORIASIS.

Synonyms.—Lepra (Willan); alphos (E. Wilson); lepra alphos; Fr., *psoriasis;* Ger., *Schuppenflechte.*

Definition.—A chronic and recurrent disease characterized by inflammatory, dry, red, primarily roundish patches covered with a crust of adherent silvery scales.

Description and Course.

Psoriasis occurs in about four per cent. of all forms of diseases of the skin in America, while in Northern Europe its frequency is from seven to eight per cent. It thus ranks the fourth highest in frequency in public and the second highest in private practice.

Earlier writers made numerous varieties of psoriasis, but they were founded chiefly upon the different appearances presented by the disease in its different stages of progression and retrogression and are scarcely worth preserving. The term psoriasis should not be applied to the scaly syphilides of the secondary or tertiary periods. The only important varieties are those produced by its development with acute or subacute phenomena. The chronic form is by far the most frequent and typical and will therefore be discussed first.

The distribution of psoriasis, in the main symmetrically, is usually a strong diagnostic feature, though in children this is not so well marked as in adults. The chief seats of election are the extensor aspects of the limbs, especially about the elbows and knees, and the scalp; next to these come the trunk and the flexor aspects of the limbs. The lower part of the face is not often attacked except in nursing women, while the palms and soles are rarely involved, but the nails are frequently affected. No part of the body surface is absolutely exempt, but the disease never attacks mucous membranes, the so-called "*psoriasis linguæ*" being an entirely different affection. It is often possible to trace nearly all the stages of development simultaneously in the same individual. It begins as a pinhead-sized, red, slightly convex papule which very soon has a tiny cap of scales (P. punctata).

This enlarges peripherally into a scaly spot (P. guttata); continuing to enlarge it forms a disk slightly raised above the surrounding healthy skin, from which it is sharply defined at the border of the red, highly vascular base. It is nearly concealed by the spongy crust of silvery scales which when well developed is highly characteristic. The deep portion of the crust is closely adherent to the red part of the disk, and if detached forcibly exposes a number of bright-red vascular points, many of which bleed, which is another characteristic feature. These primary disks vary in size from the smallest to the largest silver coin (P. nummulata).

Larger areas of disease are formed by coalescence of the primary plaques constituting P. diffusa, the borders of which are festooned or gyrate. When psoriasis is retrogressing, it clears first in the centre of the disk or irregular patch and forms rings or gyrately outlined figures (P. circinata, P. gyrata), and this aspect therefore is a favorable one. Occasionally, however, psoriasis on the trunk picks out and follows the arrangement of the hair follicles, and gyrate outlines are primarily produced which Willan and his followers called lepra, a term now reserved for leprosy. Unimportant variations are seen when the scales are more heaped up than usual (P. rupioides). The eruption is dry throughout its course except in rare instances when there is pus beneath the crusts (P. empyodes). The most typical and familiar aspect is the stage of disks of various sizes scattered more or less abundantly over the extensor aspects of the limbs, upon the scalp, and perhaps the trunk. More or less coalescence of the disks is usually met with about the elbows and knees. Itching may be either present or absent, being most marked in the actively hyperæmic cases and in gouty subjects. The disease does not affect the general health, even when very extensive, but the general health has often a very decided effect upon the course and development of the eruption. The course is decidedly chronic, each attack if untreated lasting usually for many months, and in some cases there are only remissions, more or less prolonged, the eruption being present for many years. Young subjects, however, generally get rid of the eruption for a time even without treatment.

Whether the eruption is removed spontaneously or by treatment, it is almost sure to recur; but while some have one or even two attacks a year, others may have several years' freedom from their malady. The site of the patches is marked in some cases by redness of short duration or by dirty yellowish pigmentation which fades slowly, especially in cases healed by arsenic.

In the majority of cases there are at first only a few patches for a long time, and then others gradually make their appearance, but in

some patients, especially those who have had previous attacks, the disease sometimes develops rapidly, scores of fresh spots appearing almost daily, until the whole body surface is thickly sprinkled with the eruption.

The acutely inflammatory cases present many important deviations from the subacute cases already described. The eruption is not so specialized in its distribution, and although the extensor aspect of the limbs is still the favorite site for commencing, it may attack any part, even the palms and soles. The eruption is no longer in disks only, but large patches of extremely bright-red color rapidly develop; the borders are less sharply defined, the surface is very hot to the touch, and burning, tingling, itching, and tension are felt over the affected area. The scales are no longer imbricated into crusts, and silvery but large flakes of skin shell off rapidly and are as rapidly reformed, so that the patient sheds large quantities of scales into his bed or clothing very much as in pityriasis rubra, into which such cases are apt to develop if not checked by timely treatment. Nevertheless the eruption is still quite dry unless exudation is excited by scratching. Limited areas with these characters sometimes occur in elderly people, and it is not always easy to say whether the eruption is not actually an eczema, constituting what Devergie called psoriasis eczémateux.

In these acute cases the hair is often lost in the parts of the scalp attacked, while in the chronic form the growth of the hair is not usually interfered with. On the other hand, the chronic form often affects the nails, which it may attack in various ways, the most common being a dirty yellowish discoloration and loss of polish, beginning at one distal corner and extending back to the matrix; or the nails may be broken with pits, furrows, and discolorations with thickening and roughening of the surface. The change may start from the root of the nail or in some part of the blade.

A few unusual complications may be mentioned, such as deep pigmentation occurring early in the development of the eruption instead of being only a sequel; achromia, instead of pigmentation, may occur as a sequel, though temporary achromia after chrysarobin treatment is the natural result of the application; scarring, keloid, warty development, and epithelioma are other very rare accidents.

Etiology.

Sex is probably not an important factor, as in some countries males, in others females predominate, or the numbers are nearly equal. Thus, according to Bulkley, females largely predominate be-

tween the age of ten and fifteen, while between fifteen and twenty-five the males largely outnumber the females.

In America, Denmark, and Vienna there is a greater proportion of males than of females, varying from two to one (Hebra) to seven to five (Bulkley); but in the author's hospital cases the female sex predominated as two to one, while in his private practice and in McCall Anderson's practice the two sexes were about equal.

Age.—Psoriasis may in general terms be said to commence between five and fifty years of age, for not more than five per cent. begin over fifty, and probably not one per cent. begin below five years. Thirty-eight days (Rille) and eighty-five years (E. Wilson) are the extremes on record. The number of cases recorded below two years may be counted on the fingers. In Rille's case the disease was said to have begun a few days after birth, and the child was thirty-eight days old when shown. Neumann's case was four months, Kaposi's eight months old; H. Hebra had two one year of age, Elliot, one of eighteen months, etc. Of the remaining ninety-four per cent., seventy-two per cent. begin before thirty, twenty-two per cent. between thirty and fifty, and the numbers for the first three and last two decades respectively are equal.

Heredity, which is present, at least as far as predisposition is concerned, in a moderate proportion of cases, has been disputed by some authors recently, but not, in my opinion, on adequate grounds. The view that the disease is communicated by contagion from parents to children and from sisters and brothers to each other is not supported by facts. At the same time it must be admitted that there are a very few examples of contagion under special circumstances (including experimental inoculation), but considering the frequency of the disease these isolated instances are not sufficient to invalidate the statement that for all practical purposes psoriasis is not contagious. It cannot be disputed that if one or both of the parents have psoriasis, it is pretty sure to develop in one or more of their offspring; but it is exceptional for several brothers and sisters to have it.

A few cases have appeared to be an immediate consequence of vaccination, and in one instance the eruption appeared in the scars of a recent small-pox.

Excessive meat-taking has been asserted to be an etiological factor, and vegetarianism is suggested as a prophylactic and curative method. On the other hand, the author of this article has seen the disease in a girl who had a natural dislike to meat of any kind and had scarcely ever eaten even a piece of bird or fish the size of one finger at one time. Probably the consumption of meat is only an indirect cause after thirty, as conducive to gouty conditions. The im-

portance of gout as a factor has been much exaggerated. When psoriasis begins after forty years of age, however, the matter is on a different footing, and gout or its predisposing factors, dyspepsia and constipation and alcoholism, together made up half of thirty consecutive cases in the author's private practice in which the disease began after forty years of age.

Diseases of the nervous system play a much smaller rôle than is claimed by Polotebnoff and some others, but a few cases have started as a result of nerve shock from grief or anxiety. On the whole, it cannot be asserted that in those cases which begin after thirty the patients are in sound health. In younger persons the complexion is often clear and ruddy and the patients or their parents say they are in excellent health, but even these are often found not to be up to their highest standard of health, and any debilitating cause is almost sure to determine an outbreak in those who are predisposed. This is well exemplified in nursing women who are liable to psoriasis. If they nurse their children for any length of time they are almost sure to suffer from an outbreak, often of a severe and extensive kind. Persons who have rheumatoid arthritis often have psoriasis, and as there is much hyperidrosis in most of them, localized epidermic thickenings are common also.

Pathology.

The pathology of psoriasis is still a moot point. Many authorities do not even admit that it is an inflammation of the skin, but contend that the primary change is in a hyperplasia of the rete cells due to an abnormality of keratinization, to which the inflammatory changes admittedly present are secondary; but, inasmuch as even in a microscopic papule both the rete changes and the inflammatory signs in the papillary layer are always present together, this cannot be said to be proved.

Then as to the pathogenesis of the lesion, there is much dispute as to whether it is due to a microbe or to some neurovascular change. In the opinion of the author a microbe *ab extra* will not account for the clinical facts of symmetry and in many cases the simultaneous or rapid development of a large number of lesions on both sides of the body. These might be accounted for by the supposition of microbes circulating in the blood which, under the conditions already discussed as predisposing causes, excite neurovascular and rete changes in the skin; and when the surface of the skin is once disturbed, secondary invasion of various microbes readily occurs and may produce secondary changes.

Diagnosis.

The diagnostic features of psoriasis are: The absence of discharge throughout its course; its symmetrical distribution with strong predilection for the scalp and the extensor aspect of the limbs, especially about the elbows and knees; its mode of development from papule to disk; the characteristics of the disk—viz., a rounded, well-defined nummulated bright-red base almost covered with a crust of imbricated, silvery white scales, the lower layers of which are closely adherent to the base, and if forcibly removed bright-red or even bleeding points are exposed.

With such a combination of symptoms error ought to be impossible, but difficulties arise when some of these features are absent, ill-marked, or modified by various circumstances.

Thus symmetry may be absent from some local cause, developing lesions on one side and not on the other, or the development of the companion patch may be delayed. In the acute cases the disks are less raised and defined, and the scales are thrown off so fast that they have not time to adhere into crusts, nor are they adherent to the base but flake off readily. Or the scales may have been removed by the frequent ablutions of the patient or by previous treatment.

In acutely developing cases also and in young children and in some other cases without recognizable cause, the special localization is not so marked and the eruption may begin on some unusual part, such as the palms and soles, or on the trunk without attacking the limbs.

In actively hyperæmic cases, itching is such a marked feature that some exudation may be induced by violent scratching, so as to simulate eczema, or over-irritant remedies may excite an eczematous discharge. Error from most of these variations may be avoided by taking the symptomatology present as a whole and not depending too strongly upon any one sign, which is the commonest source of error in the diagnosis of all diseases.

The diseases most like it are the dry forms of eczema, the psoriasiform seborrhœic dermatitis, the patches or infiltrations of lichen planus, pityriasis rubra, pityriasis rosea, squamous syphilides, tinea circinata, and some scaly forms of lupus erythematosus.

Eczema.—If there is a history or the presence of discharge the problem is at once solved, but if the eruption is in patches and more defined than usual on the extensor aspect the diagnosis may not be easy. Attention should be paid to the following points: the patches of eczema are seldom well defined; the scales are in a single

layer, not in adherent crusts; if there are any crusts present they are composed not of scales only, but of dried exudation mixed with scales; if the scales or crusts are removed forcibly, exudation of serum is more likely to ensue than that of blood, and the bright-red points are not seen in the exposed surface; if the whole of the eruption is examined, it is probable that in some parts the distinctive features of eczema will be found.

In *psoriasiform seborrhœic dermatitis*, the individual lesions often resemble very closely the appearances sometimes presented by psoriasis. Position plays an important part in the diagnosis, this eruption being usually in the axillæ and on the trunk and not on the limbs; but it is often on the scalp with the addition of the scurfiness of seborrhœa which may have been present for a long time before the actual inflammatory eruption appeared. The lesions are bright red and defined but are not so scaly, and the scales are not so adherent as in psoriasis and often are distinctly fatty instead of silvery.

Lichen Planus.—Only the patches of lichen planus resemble those of psoriasis. They are common on the front of the leg, but are not so likely to be in the other psoriasis positions; the scales are not in crusts, the infiltration is greater as a rule; the color is a violaceous red hue, which should always suggest the idea of lichen planus, and a search for the characteristic flat angular papules rarely fails. Staining as a sequel is a much more marked feature of lichen planus.

Pityriasis Rubra.—This resembles only the acute, highly inflammatory forms of psoriasis. The scales as a rule are much more papery and abundant in pityriasis rubra, but the most reliable feature is that pityriasis rubra becomes rapidly universal unless promptly taken in hand. Acute psoriasis is often limited to a few regions, and though it may cover large areas it is never universal; but it must be borne in mind that pityriasis rubra may be developed from this form of psoriasis. As the treatment is on the same lines for both conditions, when the psoriasis is very extensive, the diagnosis is not important from a practical point of view.

Pityriasis Rosea.—This resembles psoriasis only in being often in well-defined disks, dry and scaly; but the distribution is mainly on the trunk and the upper segments only of the limbs, with a tendency for the long axis of the ovals to be placed horizontally on the trunk. The disks are very pale red, scarcely perceptibly raised above the surface, and the scales are extremely fine, delicate, and scanty. The eruption is also more acute in development and course, often spreading all over the trunk in a week or two and seldom lasting more than a month or six weeks, even without treatment.

Squamous Syphilides.—The squamous syphilide of the early secondary period is the form which most frequently exercises the mind of the practitioner. In this the patches are always small, seldom over half an inch in diameter. The scales are never abundant nor in crusts, and are dull-looking instead of being silvery. There are no bright-red points exposed when the scales are scratched off, and the patch which fades as a whole, not by clearing up in the centre, leaves a marked fawn-colored stain which is more significant on the arms than on the lower limbs. The ground color, though sometimes bright at first, soon acquires a brownish or fawn-colored tint. The distribution of the eruption predominates somewhat on the flexor aspect of the limbs. As a whole it is continuous, *i.e.*, distant points like the elbows and knees are never attacked while the intervening portion of the body is free. The scaly syphilide is often associated with other forms of eruption and corroborative evidence from the presence of lesions in other organs is sure to be obtainable.

The *circinate* or *orbicular syphilide* may also be mistaken for a psoriasis in the process of clearing up. The position of this syphilide at the borders of the hair, on the forehead and nape, and round the mouth, or at least on the lower half of the face, and its absence in the psoriasis positions should excite suspicion. Moreover, the scales are much less abundant, the eruption is in rings from the first, and again there will be corroborative evidence of syphilis if it is carefully sought for.

In the *tertiary stage*, lesions are sometimes met with very like a heavily crusted psoriasis. These are not in the psoriasis positions, are asymmetrical, often on the face, few in number, and in some, on removing the crusts, a certain extent of ulceration may be found.

Tinea Circinata.—The small number of the lesions, the absence of method in their distribution, the scantiness of the scales, and the very definite circular shape, which may or may not be clear in the centre, will generally lead to an easy decision.

Prognosis.

The eruption can always be removed for a time by appropriate treatment, but it is almost sure to return either in the following or subsequent years. In a few cases long intervals of freedom are experienced, but they can never be promised to any one.

TREATMENT.

The treatment of attacks of psoriasis may sometimes be effected by internal treatment alone or by external treatment alone, but the combination of the two methods is preferable in most cases.

For many years arsenic was the sole drug which was supposed to have any effect upon psoriasis, but of late other remedies have been proposed, some of them being in appropriate cases much more rapid and efficient than the time-honored arsenic. These more or less successful rivals are iodide of potassium in heroic doses, dried thyroid extract, and salicin and its derivatives. The respective merits of each will be briefly considered, but before discussing these "specifics," as they are somewhat inaccurately called, it should be said that they all claim a more important place in psoriasis than in many other skin affections, because, as we see it in early life and up to the age of thirty, the disease frequently is associated with no detectable departure from health; and when there is no rational line suggested by the patient's general condition, we are justified in trying remedies which are known to succeed in a considerable proportion of cases, even if we cannot explain their *modus operandi*. When psoriasis begins after thirty, defects of health are frequently traceable, and it is then sounder practice to treat such defects before resorting to empirical remedies; it will often be found that by the time the general health is restored, the patient is so far advanced towards recovery as not to need any special remedy.

Although arsenic cannot be said to be in any sense a specific or a prophylactic, fresh lesions often appearing even when older ones are yielding to its influence, yet it must be admitted that in some cases it exercises a very beneficial effect on the lesions, although in others, and these unfortunately the majority, it fails to have any effect or has too slight a one to be of practical advantage; while in some persons its influence is positively injurious, increasing the irritation and discomfort of the disease or apparently being instrumental in producing fresh lesions at sometimes a very alarming rate.

Arsenic should therefore never be given in very hyperæmic cases nor where the disease shows an inclination to spread at the margin of the patches, nor when the patient is evidently on the verge of a general outbreak of new lesions.

It is most likely to be of service in cases in which the hyerpæmia is moderate and the disease as a whole is stationary or where there are only a few chronic patches. Even in these it is often disappointing in its effects or requires to be given in such large doses or for so

long a period that it becomes a question whether the damage often done to the digestive organs, or the pigmentation of the skin which may ensue from its being taken for too long a period, does not outweigh the temporary relief from the disease which might have been obtained at a smaller cost.

It may be given in the solid form as a pill, the so-called Asiatic pill being a favorite form in Germany; its formula is: Arsenious acid, grs. 8¼; powdered black pepper, gr. 67½; gum arabic and water, sufficient to make a mass which is to be divided into one hundred pills; each pill contains gr. $\frac{1}{12}$ of arsenious acid. From one to three pills are to be taken three times a day before eating, the Germans say, but it is much less likely to upset the stomach if given after meals. Most English and American authors, however, prefer the liquid form, of which Fowler's solution is practically the only one worth discussing. Five minims is the medium dose, but it is best to begin with ♏ iij. and gradually increase to ♏ v. to x. three times a day, according to the patient's tolerance of the drug. It is generally combined with a bitter tonic (of which tincture of hop in doses of ♏ xx. is one of the best) and given freely diluted directly after meals. It may be necessary to take it for three months or longer before its beneficial effects are plainly manifest, unless local treatment is simultaneously employed. Too often it has to be given up on account of its irritant effects upon the gastro-intestinal canal, or from its toxic effects being plainly visible by pricking of the conjunctiva and puffiness of the eyelids. More marked and persistent staining of the site of the patches occurs in cases treated by arsenic than in those without it. For these reasons, and on account of its uncertainty of action on the disease, its employment in the author's practice grows less every year.

Iodide of potassium in large doses has been strongly recommended by Greve, Boeck, Haslund, and others, and no doubt has a very good effect in some cases. It is recommended to commence with ten-grain doses, then increase to fifteen grains three times a day, and when tolerance is established the dose may be rapidly increased. As much as fifty grammes a day has been reached. In the author's opinion, however, iodide of potassium is not a drug to be given indiscriminately, and has often a very injurious effect on the patient's organism, especially the alimentary canal; and as even better results may be obtained by other means at less cost to the patient, the author seldom employs iodide of potassium for the treatment of psoriasis. Its effects on the disease may be due either to its diuretic action or to some nascent iodine being set free in the circulation.

Byrom Bramwell discovered that the administration of thyroid

extract had a marked effect in some cases of psoriasis, and the striking results which he obtained in some of his cases raised high hopes that a real specific had been discovered at last. Further experience has, however, shown that it has much narrower limits for its application than was at first anticipated. In the right cases, however, its action is very rapid and striking, the hyperæmia diminishes, the scales fall off and are not renewed, and some cases are cured in a month and require only a little local treatment to clear off the remaining fragments of the disease. It must, however, be commenced with caution, as on some persons it exercises a most depressing and injurious effect.

At first only one five-grain tabloid of the dried extract should be given each day, after three or four days two may be tried, and at the end of a week or ten days, if no unpleasant symptoms are produced, three tabloids a day may be given. This is usually sufficient, and although, when the patient was under close observation, Bramwell has reached as much as forty tabloids a day, it is neither necessary nor prudent to increase the dose beyond three or four tabloids per diem, unless, as in that case, the patient is under constant observation.

If no effect is produced within a month, the drug may be considered to have failed. Unfortunately, it cannot at present be predicted in which cases it will succeed, though certain contraindications for its employment have been ascertained. It should not be given to old persons, or to any one with weak heart. It should not be given in the increasing stage of psoriasis, as sometimes scores of new spots rapidly develop under it. It should not be given or should be tried very cautiously in extremely hyperæmic cases. It appears to be very capricious in its action, failing in one attack after it has succeeded in a previous one in removing the eruption, and it has no prophylactic effect. It is usually well borne in children and sound young people and is often effectual in such cases.

The use of this remedy in the author's practice has, however, been in a great measure superseded since he discovered that salicylate of sodium or salicin had as marked an effect as thyroid at its best, while it never did any harm unless the dose was excessive. It has acted best and most strikingly in the rapidly developing cases in which arsenic and thyroid are contraindicated. A case of psoriasis guttata, thickly distributed over the whole body, was removed without local treatment in three or four weeks, the patches growing paler and the scales falling off and ceasing to be renewed. In cases of long standing its action is slower, but even in most of these improvement results more rapidly than from any other internal treatment, thyroid excepted. But salicylate of sodium suits a far larger proportion of cases and excites

no injurious effects except that occasionally slight giddiness, dyspepsia, and once in a very large number of cases a salicylate erythema may be produced; in a few of the author's cases there was temporary aggravation of the itching. The dose was fifteen grains for an adult three times a day after meals, and once or twice when this dose was exceeded the disease began to extend, but again improved when the normal dose was resumed. Even these slight drawbacks named may be avoided by using pure salicin instead of the sodium salt. It may be given in solution in fifteen- or twenty-grain doses three times a day, and even larger quantities in suspension may be given with impunity, one case reaching one hundred and eighty grains a day. It is most likely to fail where there are only a few chronic patches with very little hyperæmia. In these arsenic would probably be preferable as far as internal remedies are concerned, though, as will be presently shown, efficient local treatment is best of all for this sort of case.

The action of salicin or its derivatives is due, in the author's opinion, not to its antagonism to an underlying rheumatic or arthritic diathesis, but to its breaking up in the organism into salicylic acid, which has a microbicide action in the blood or lymphatic circulation, in which it is probable the materies morbi exists and is thence deposited in the skin tissues. This view acquires some corroboration from Brault's observations of two cases of psoriasis which were cured by injections of yellow oxide of mercury .05 cgm. The cases were cured by seven injections spread over three months, though at the end of one month, after four injections, they had immensely improved. Unless, therefore, there is some distinct indication to follow in the general health of the patient, salicin or salicylate of sodium should, in the author's opinion, have a fair trial in a case of psoriasis.

Besides these a very minor place may be claimed for phosphorus, carbolic acid, antimony, and turpentine (in ten- to fifteen-minim doses with diluents). The last two drugs are better than the first two and are chiefly suitable for cases with a high degree of hyperæmia. Diuretics, such as acetate of potash, are also useful sometimes in this class of cases. In very widespread eruptions with a highly inflammatory condition, large doses of quinine, gr. iij. to v., dissolved in the acid portion of an effervescing citrate of potassium mixture, as described in the treatment of pityriasis rubra, are of high value.

Local Treatment.—The local treatment of psoriasis is of the highest importance; indeed, the great majority of cases can be efficiently treated by local treatment alone if the patient will give himself up to treatment and can have it efficiently carried out by trained nurses under skilled supervision.

In all cases the first indication is to remove the scales. This may

be done by various methods, such as (1) immersion in warm alkaline water (℥ ij. to iv. of bicarbonate of sodium dissolved in a thirty-gallon bath) at a temperature of 100° F., the patient to remain in half an hour, rubbing himself with his hands or flannel. Then after drying, whatever application may be considered suitable should be rubbed thoroughly in. (2) Wet packing in the usual hydropathic style. (3) Soft soap firmly rubbed in with flannel wetted with warm water, and then rinsed off; especially suitable for the scalp and indolent patches on the elbows and knees. (4) Wrapping a limited area in glycerole of the subacetate of lead, 1:8 of water; this reduces the hyperæmia as well as softens the scales, and in acutely inflammatory cases may be all that is required. When the scales have been removed the next indication is to reduce the hyperæmia if it is marked, and this may be effected by the glycerole of subacetate of lead as already mentioned or by the constant application of calamine liniment (calamine, ʒij.; zinci oxidi, ʒss.; liq. calcis, olivæ, āā ℥ss.), or by thickly covering the part with a soft paste (zinci oxidi, pulv. amyli, āā ʒij.; vaselini, ℥ss.) and then applying butter cloth. If the hyperæmia is moderate or slight, this preliminary soothing treatment may be omitted and one or other of the following applications may be rubbed in very thoroughly. Much of the success of the treatment depends on the thoroughness of the inunction, and in an extensive case the attendant may have to spend two or three hours a day on it, a proceeding obviously impossible for the patient to do for himself. The number of remedies recommended as infallible in the treatment of psoriasis testifies to the obstinacy of the disease, and it is neither necessary nor desirable even to enumerate them. A very limited number of medicaments will be requisite if the medical attendant thoroughly understands what is required and how to obtain it. As a rule the less the hyperæmia the stronger may be the local remedy. They will be enumerated to some extent according to their strength or stimulating effect, though doubtless a large part of their action is as microbicides. The following are all supposed to be made into ointments with a base of lard, vaseline, or lanolin, up to ℥i. The mercurial preparations, such as the nitrate ointment, ʒij.; ammoniated mercury, ʒss. to ʒi.; the yellow oxide, ʒi., is rather stronger; the bichloride, gr. i., or more. Of course mercurial applications should be used only over limited areas and should never be continuously applied. Tar preparations and drugs with a similar action, such as oil of cade, oil of birch (ol. rusci), creosote, all from ♏x. to lx. or more to the ounce. Thymol, β-naphthol, resorcin, salicylic acid, all from gr. x. and upwards to the ounce. The last three are clean preparations and have no smell, and thymol has only the odor

of oil of thyme. They can therefore be used on the face and are least likely to interfere with the patient's avocations. Strongly penetrating drugs are turpentine, pyrogallic acid, and chrysarobin. These are very powerful remedies, and while on limited areas they may be used even up to ʒ i. or ij. to the ounce, it is always wiser to begin with weaker proportions and increase if necessary. Pyrogallic acid should never be used over large areas, as dangerous symptoms are apt to arise if there is much absorption of the drug.

Chrysarobin, although one of the most powerful local remedies for psoriasis, has many drawbacks and requires caution in its employment. It produces staining of linen, which in contact with the alkali of soap forms an indelible purple. It is liable, when absorbed, to produce an erythematous blush extending beyond the area of application and attended with great itching. For the above reasons it should not be used on the head, as it stains the hair and is liable to excite conjunctivitis. It is unsuitable when there is active hyperæmia, as it is a powerful irritant. In suitable cases it sometimes acts like a charm, leaving a white area to mark the site of the psoriasis patch. The author employs it chiefly at the end of other treatment to clear off remaining fragments, and many of the disagreeable features attending its use may be avoided by applying it as a paint made by mixing from gr. xx. to lx. with ʒ x. traumaticin (pure gutta-percha 1 part, chloroform 9 parts, mix with frequent agitation for twenty-four hours). After removing the scales by soft soap or other means, the substance is to be painted on with a stiff brush once a day for a week.

Various substitutes have been recommended to avoid these disagreeable effects, among others anthrarobin, but this is less powerful and stains to some extent. Gallanol has also been recommended, and it is certainly less dangerous, but again not so powerful.

Sometimes over large areas a lotion is a more convenient application, but it is seldom quite as good: Liquor carbonis detergens, ℥ i. to ℥ x. of water or stronger, is a good application. Creolin may be similarly used.

For the scalp, soft-soap inunctions as already described, or a spirit soap lotion (sap. mollis, ℥ i.; sp. vini rect., or eau de Cologne, ℥ ij.), to be rubbed in with wet flannel, rinsed off, and then the chloride of mercury pomade rubbed in.

With all these remedies the secret of success is their thorough application to the diseased area, together with the judgment born of experience to go far enough and yet not too far, to know when to stop stimulating applications and to apply soothing ones, and *vice versa*, and above all not to be tied to any one drug or method of treat-

ment for all cases. When in doubt, always choose the weaker application and gradually increase the strength according to effect.

The use of spas, thermal and sulphur, may be alluded to. Except when they are situated on high altitudes and the invigorating climate exercises an important influence, they will not do more than can be effected at home if the patient will surrender himself completely to treatment. They are chiefly for wealthy patients who cannot or will not devote themselves to getting well and subordinate their treatment to their business or social engagements. At Leuk and similar spas the whole treatment depends on prolonged soaking in warm alkaline water and weak sulphur baths, such as can be obtained at Aix-la-Chapelle, Harrogate, Strathpeffer, etc., and they are useful, first as warm-water immersion and secondly because of the microbicide action of the sulphur water. Very acute cases should not be sent to these spas, as they often aggravate the eruption.

There are also a few spas the waters of which contain arsenic, such as Levico, Bourboule, and Royat. Levico in the South Tyrol near Triente, is 4,880 feet above the sea level. It is the strongest of the arsenical spas and has two main sources, the strongest of which contains gr. $\frac{1}{12}$ arsenious acid to the pint, and gr. xxxiv., chiefly persulphate, of iron. The dose is one tablespoonful. The weaker spring contains gr. $\frac{1}{120}$ arsenious acid to the pint, and gr. viij. of proto- and persulphate of iron. The spa is not much visited, as the imported waters can very well be taken.

La Bourboule in the Puy de Dôme, France, is the best known and most visited of the arsenical spas. The arsenic is in the form of arseniate of sodium, 28 mgm. to the litre, or between one and a half to two grains to the gallon. The waters also contain lithium, sodium, and potassium chloride; sodium bicarbonate, lime, iron, and free carbonic acid. A large tumblerful is the average dose.

At Royat there are some similar springs, but much weaker. The strongest, Saint Victor, contains about one-sixth as much arsenic as La Bourboule, but more iron.

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PITYRIASIS RUBRA.

Synonyms.—Dermatitis exfoliativa; pityriasis rubra aigu (Devergie); erythrodermie exfoliante (Besnier).

Definition.—Pityriasis rubra is an inflammatory disease involving the whole cutaneous envelope and characterized by intense redness with abundant flaky desquamation.

The disease was first described by Devergie, and subsequently Hebra described one form of the disease to which the German school would restrict the title pityriasis rubra, while all the other forms are classed under dermatitis exfoliativa; but this is not, in the author's opinion, justified by the clinical facts, which support a wider view of the subject.

Pityriasis rubra may be either primary or secondary, but as the clinical symptoms, course, and treatment are practically identical when the disease is fully developed, there is not any advantage in

drawing the sharp line of distinction between them as is sometimes done.

Description and Course.

In a typical primary case the eruption appears suddenly either without or with slight antecedent symptoms. If present they are usually slight and vague, such as debility and depression. Occasionally in recurrent attacks there is prostration at the onset, or there may be rigors and marked rise of temperature, even to 100° or 104° F.; but this is exceptional and does not last long, though it may recur with relapses. The eruption at first appears as a redness of the skin, either diffuse and then spreading rapidly and soon becoming scaly, or in circumscribed well-defined patches, also soon scaly, and appearing symmetrically, spreading peripherally, and multiplying rapidly. It begins most frequently when primary on the chest or limbs, but may commence anywhere. By multiplication and extension the whole surface soon becomes involved, so that in a period varying between a few days to a few weeks there may not be a square inch of healthy skin left. In a smaller number of cases the extension is much slower, and it may be months before the whole body is completely covered.

The ground color of the skin is an intensely bright red at first, but may become of a deeper and more venous hue. The color is, however, in great part concealed by the scales, which are thin and papery and slightly imbricated like tiles on a roof. They are usually small upon the face and very large, one or two inches square, on the trunk and upper segments of the limbs, but the size varies in different cases. The scales get rubbed off by the movements of the patient in bed, from which two or three pints or more may be collected in the twenty-four hours. The epidermis of the palms and soles is exfoliated in large masses, leaving the surface beneath thin, red, and tender. The face is sometimes swollen and puffy, but there is very little thickening of the skin generally. The surface is usually quite dry where the scales are easily detachable, but if they are taken off before they have become loose the surface is slightly moist. In cases which have begun as an eczema exudation may be marked, but very often profuse sweating, especially from the axillæ, may be mistaken for exudation.

Rhagades are exceptional; but the upper layer of the epidermis splits and there is a great feeling of tension of the skin, with burning, tingling, tenderness, and chilliness, although itching is usually absent or slight. The nails are usually thinned so that they indent easily, but sometimes in the more chronic cases there is an accumulation of

scales beneath them and then they are thick and opaque. Eventually they may be thrown off together with the hair. In one case (Hutchinson's) the hair when renewed was quite white and remained so.

The tongue is preternaturally red, smooth, and evidently exfoliates, as a rule imperceptibly, but sometimes white patches are seen upon it at first.

When the disease is fully developed, it generally remains without change for some time (several weeks or months), the shedding of scales continuing. In long-standing cases, however, there may be some thickening of the skin, the redness diminishes, the scales become smaller, and the natural lines grow more accentuated, so that what Brocq calls "lichenification" is produced; or the affection may follow the course of Hebra's form of the disease, in which the skin becomes generally thinner, almost cicatricial, and the eyelids are drawn down. An ordinary attack will often last about six weeks, a few not so long, and many much longer—for months or even years, with remissions and exacerbations, but never entire freedom. Most cases get well for a time but are very liable to relapses. Thus one of the author's cases had thirteen attacks in seventeen years. Nine of these were partial and were possibly only psoriasis in its acutely hyperæmic form, but the last four were universal and typical. A fifth came on suddenly before the fourth was gone, with sore throat, a temperature of 102° F.; four days later there was an attack of sudden swelling and redness of the face like erysipelas. The disease became universal; the night temperature was 104° F. There was slight albuminuria, rapid emaciation, the patient sank into a typhoid condition with pulmonary œdema and died in fourteen days from the onset of the recurrence, and nine weeks from the time when the fourth attack became general. There was nothing in the post-mortem examination to account for death except the pulmonary œdema and a large soft spleen. Diarrhœa is a not uncommon late complication of fatal cases.

Among antecedent general diseases acute rheumatism is one of the most frequent. Gout also, acute or subacute, is not uncommon, and attacks like erysipelas, but possibly only lymphangitis, which may be considered a part of the disease, have been repeatedly observed.

The secondary attacks are more frequent than the primary. A very large proportion of the cases have developed on a widespread eczema or psoriasis, the latter being by far the most frequent antecedent in the author's experience, but S. Mackenzie thinks that more cases follow eczema. The disease may, however, develop on almost any kind of dermatitis, and cases following lichen planus, or erythema papulatum with pityriasis capitis are on record, while Brocq re-

cords an instance of its being excited by the vigorous application of chrysarobin, and the author has seen it follow the application of arnica and the too vigorous inunction of unguentum hydrargyri. Similar observations have been recorded by the older writers in times when mercurial inunction was used so extensively in the treatment of syphilis that the patient frequently suffered more from the mercury than from the syphilis.

In exceptional cases itching may be an early and marked symptom; fluid exudation may be considerable, but, as already explained, in some of these cases the fluid is sweat and inflammatory exudation. Partial attacks do sometimes occur. Some of these become universal, either after persisting as limited attacks for some time, or in a recurrent attack. In a few cases the scales are small and powdery with moderate hyperæmia. In some cases with inflammatory redness and persistent desquamation, either universal or partial, vesicles or imperfect bullæ may be developed. Some cases begin with sudden swelling and redness of the face like erysipelas, with fever but without characteristic general symptoms, and some attacks follow immediately on what have been described as attacks of true erysipelas. In rare instances there is intense pigmentation of the affected skin. Such cases have been observed by Brocq, Handford, and the author. Gangrene of the skin in small patches sometimes occurs over points of pressure, such as the shoulders, sacrum, and thighs; Vidal and Kaposi have each recorded a case of this kind. Pityriasis rubra pilaris has been observed as a sequel by Devergie and Tilbury Fox.

Hebra's type of pityriasis rubra is rare, is not secondary to other forms of eruption, and is very slow in its development and course. It is characterized by redness, which gradually increases in extent and intensity. On this red surface comparatively small scales form and are constantly shed and renewed. On the lower limbs the redness ultimately assumes a venous hue, while towards the end of the case the whole skin loses its redness and becomes of a yellowish tint. Then it atrophies and shrinks, a marked feature which is considered diagnostic. There is little or no disturbance of the general health at first, but ultimately the patient wastes away with increasing weakness and death takes place from exhaustion. If all the cases exactly conformed to this description the contention of Jadassohn and others that this is an entirely separate affection might carry some weight; but Jadassohn himself quotes Kaposi and H. Hebra that the above picture is incomplete and that the following additions must be made: In some cases the prognosis is not unfavorable; sometimes the desquamation is large and free; the skin may be thickened instead of thinned; there may be itching and slight dis-

charge. These additional symptoms seem to give the whole case away, as they are all symptoms met with in the ordinary forms, and Hebra's type must therefore be considered as a mere variety.

On the other hand, Brocq's "desquamative scarlatiniform erythema" ought not, in the author's opinion, to belong here at all; it is more allied to the toxin erythemata.

A remarkable *epidemic form* has been seen in the Poor-Law Infirmaries of London every year since 1891 inclusive and at the Greenock Infirmary in 1888. It has been described as epidemic exfoliative dermatitis, epidemic eczema, and epidemic skin disease (Savill). There was a moist type like eczema and a dry type absolutely indistinguishable from typical pityriasis rubra, and even in the moist cases there was always free exfoliation of the epidermis. As might be expected among the aged infirm or previously debilitated middle-aged, there was a heavy mortality. Some of the attendants and some young persons and children were also attacked, so that it was not confined to old or diseased subjects. There was very little that was remarkable in the skin eruption itself. It was in the circumstances of its occurrence and the evidently contagious character that the interest lay. As a rule there were no antecedent symptoms, but in the minority anorexia, vomiting, diarrhœa, and sore throat were observed. Fever was absent except towards the end of severe and fatal cases. The author observed in a large number of cases, personally examined, enlargement of the occipital and post-sternomastoid glands. It was absent in the very aged as might be anticipated, and it was present in cases in which there was no eruption on the head to which it could be secondary. The eruption began as acuminate papules, and in fifty-seven per cent. began on the exposed parts of the body and in seventeen per cent. on the lower limbs. The papules coalesced into patches and these multiplied and extended over the whole body with the formation of abundant flaky scales. In some of the cases vesicles formed on the papules and the eczematous type was produced. A few had round, well-defined erythematous patches at the onset, and some seemed to start from a local patch. The disease ran its course in from six to eight weeks in universal cases. Relapses and even second attacks appeared. This disease has not been confined absolutely to these poor-law communities. In one instance which came under the author's cognizance, all the members of a family were affected, the father, mother, and three children, living in the country in an isolated, large, healthily situated cottage. No cause could be assigned for the disease nor has the cause been traced in spite of a Government inquiry. The milk supply has of course been especially investigated, but although in one outbreak it seemed to be

probable that it was at fault, in other instances it was against evidence to blame this or other ingesta. Savill and Risien Russell isolated a diplococcus with some resemblances to Staphylococcus albus, but there were cultivation and other differences.

Echeverria's histological observations also do not throw any light on the nature of the disease. They show that the inflammation is very superficially seated, and he claims that the process shows a new sort of degeneration of the nuclei of the prickly layer.

The problem as to how the micro-organism which is the presumable cause of the disease gains entrance into the system and why it should be so prevalent in the Poor Law Infirmaries is as yet unsolved. No doubt isolated cases and limited outbreaks like the one above related have occurred, and more often than the records suggest, but have passed unrecognized on account of the resemblance to ordinary forms of dermatitis.

Pityriasis rubra is rare in *children*, but may be seen occasionally in young infants when it is likely to run a very acute and too often unfavorable course.

A special form has been observed by Ritter and others in lying-in and foundling hospitals. This form begins in the first five weeks of life, the majority of cases in the first or second week, and rapidly becomes universal; it may take the usual form with either small or large scales, the surface being generally dry but occasionally moist; or there may be flaccid bullæ closely resembling pemphigus foliaceus, crusts instead of scales. General symptoms are quite absent, but the mortality is fifty per cent., from marasmus and often diarrhœa. The endemic character suggests that it may have some relationship to epidemic exfoliative dermatitis.

Etiology.

There is no absolute age limit, but the majority of cases occur between forty and sixty years of age. The male sex predominates in the proportion of three to two, probably because men are more subject to vicissitudes of temperature.

Both in the primary and secondary forms there is a close relationship between the disease and acute rheumatism or gout, and in those cases which are of the Hebra type the existence of tuberculosis in the patients or in their relations may often be noted.

As already shown, a large proportion of cases develop from some other form of widespread dermatitis, especially psoriasis or eczema. Among exciting causes exposure to sudden chills plays the most important part. An alcoholic debauch has appeared to be the excitant in

some instances, but a large proportion of cases cannot be ascribed to any definite cause and the real pathogenic factor is not known.

Pathology.

Anatomical examination of the skin shows that the disease is at first a superficial dermatitis, but when it has lasted some time the inflammation spreads to the whole depth of the skin, and eventually there may be an increase of the connective tissue, followed sometimes by cicatricial contraction with atrophy of the appendages of the skin and an excess of pigment.

These anatomical facts do not assist in the solution of the problem as to the nature of the disease. The most plausible hypothesis is that it is due to a neurovascular disturbance acting through the ganglionic centres.

Diagnosis.

The most characteristic features of primary cases are the sudden onset, the rapid extension until it is absolutely universal, and, when fully developed, the intense dry redness of the surface; the abundant continuous exfoliation of large papery scales, and the tendency of untreated cases to a downward course of marasmus and adynamia to death. The diseases most resembling it are the acutely inflammatory form of psoriasis, widespread eczema, pemphigus foliaceus, and lichen ruber.

Psoriasis.—There is very little difference in appearance between an extensive acute psoriasis and pityriasis rubra, except that the former is never universal, while universality is the rule for pityriasis rubra. The scales are usually much thinner and larger in pityriasis rubra, and while thickening of the skin is the rule in psoriasis and generally very marked, in pityriasis rubra it is either absent or in the form of œdema.

From *eczema* it differs by its universality, which is very rare in eczema. There are no crusts, discharge is usually absent, and even when present is moderate in quantity, as a rule, and may stain or stiffen linen—the apparent exception when there is abundant moisture being due to sweating. Itching is absent or slight, burning and tension being the subjective symptoms of most cases. The general symptoms are much more severe in pityriasis rubra than they are in eczema or psoriasis.

It resembles *pemphigus foliaceus* in its universality and in the general symptoms; but pityriasis rubra is much more amenable to treatment, and recovery is the rule, while in pemphigus foliaceus, though the course may be long, recovery is very rare.

In pityriasis rubra flaccid bullæ, with the consequent discharge of evil odor, are absent and the scales are thin and papery instead of thick and sodden or crusted. In short, there is as a rule a dry inflammation, while the other is always a moist one and is more often mistaken for eczema than for pityriasis rubra.

Pityriasis Rubra Pilaris or Lichen Ruber Acuminatus.—While both are universal and dry forms of dermatitis, the scales of pityriasis rubra are large and papery; in the other disease they are small, powdery, and often adherent into hard crusts. Moreover, one develops from diffuse red patches, the other from fine acuminate papules, except on the palms and soles, where there is diffuse redness also, but exfoliation is not in large masses. In many cases of pityriasis rubra pilaris there is scarcely any hyperæmia, so that it is not considered to be dermatitis by many authorities. But in other cases the hyperæmia is very marked and often diffuse in large areas, but in some part or other the papular elements are to be made out.

General desquamation, even when in large scales, after any erythematous eruption can always be distinguished by the fact that the scales, when once thrown off, are not renewed.

Prognosis.

Whenever the entire skin is *hors de combat* the case is a serious one, and pityriasis rubra is no exception to the rule. But improved treatment has considerably reduced the mortality, which is usually said to be fifty per cent., and was formerly considered to be higher still. In the author's opinion twenty-five per cent. would probably be nearer the mark for universal cases, and partial cases would not be dangerous at all if it were not that they may become universal. The prognosis is necessarily more serious in old persons or in those who have some organic disease. Some cases which seem to be doing well have sudden relapses and die rapidly. A person who has had one attack is predisposed to another, and those who have had several are very likely to succumb to an attack sooner or later.

Treatment.

In all cases of pityriasis rubra the patient should be put to bed and kept there until the disease has subsided. It is highly dangerous to allow such patients to go about, for if the disease is partial, it is more likely to become universal, and if already universal a chill, to which such patients are preternaturally sensitive, is extremely likely to excite a fatal visceral complication. Furthermore, rest and a uniform temperature are important adjuncts in the treatment of any

acute dermatitis, leading to the reduction of hyperæmia and rendering local treatment more easy of application and more efficacious.

The *dietary* of such patients should be a liberal one, so far as the condition of the digestive organs will permit, and should aim at extension of assimilable food rather than restriction founded on any gouty or rheumatic theory. If there is a rise of temperature, solid food should be withheld for the time being, but when fever is absent digestible solids may be freely given. With regard to alcohol in the early stage, it need not be given unless the previous habits of the patient render a little necessary to facilitate the administration or digestion of food. When, however, the powers of the patient are evidently failing, it may be necessary to give it with a liberal hand regardless of the effect on the skin, but its administration should not be continued longer than is absolutely necessary.

Internally, the *medicinal treatment* the author has found most efficacious in the majority of cases is quinine in large doses, given with an effervescing potash mixture, as follows:

	Potassii bicarbonatis, ...	gr. xxv.
	Syrupi aurantii, ...	ʒ ss.
	Aquæ, ...	℥ i.
M.	Sig. To be taken every six hours, during effervescence with	
	Acidi citrici, ...	gr. xv.
	Quininæ sulphatis, ...	gr. iij.–v.
	Glycerini, ...	♏ xv.
	Aquæ, ...	℥ ss.

Given in this way large doses of quinine are readily tolerated, provided the bowels are kept freely open. Diuretics, such as acetate or citrate of potassium in infusion of scoparium, are sometimes useful, and thyroid extract has appeared to be beneficial in a few cases. Its administration, however, requires care and caution, and the dose should not be more than five grains at first and cautiously increased if the patient is tolerant of it. In a case of the author's the patient improved considerably as far as the pityriasis rubra was concerned, and then a nodular syphilide appeared, which ulcerated freely in the soft palate. All the specific lesions healed under iodide of potassium.

Arsenic should not be given in the acute cases, and during the development of a case it is more likely to favor extension than to arrest it. In chronic cases, when the hyperæmia and exfoliation have diminished, it may be of service; but it is very uncertain in its results and its effects should be carefully watched, and it is better avoided when there is already gastro-intestinal irritation. It is most likely to be efficacious when at the end of a case there are some places where the eruption is slower in clearing off than in the rest.

External treatment is of the highest importance both as regards the comfort of the patient and the improvement of the skin condition. The whole body should be enveloped in an oily application. In the author's practice the two most frequently employed are calamine liniment, composed of calamine, gr. xl.; zinc oxide, gr. xxx.; lime water and olive oil, āā ℥ ss. Bandages may be soaked in this and wrapped round the limbs, and cloths applied closely to the trunk; the face may be freely painted with the liniment. Care should be taken not to expose the patient unnecessarily during the dressings, and in cold weather to warm the liniment. Another application which avoids the chilling effect of applying a liquid to so large a surface is to spread thickly a soft paste of zinc oxide and starch, āā 3 ij.; fresh vaseline, ℥ ss. This is Lassar's paste without the salicylic acid. Adherent paste can be wiped off with olive oil before fresh is applied. Some prefer glycerole of the subacetate of lead, one part to eight of water. In using it the same precautions against chilling must be observed.

Intermittent weak alkaline baths are recommended, but the danger of chill outweighs possible advantage, and they sometimes exhaust the patient. This is not the case with a continuous bath under 100° F., but the necessary facilities for this are rarely obtainable.

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PITYRIASIS ROSEA.

Synonyms.—Pityriasis maculata et circinata; herpes tonsurans maculosus (Hebra).

Definition.—An acutely developing, widely distributed eruption, characterized by round or oval, pale red, slightly scaly patches or rings.

Description and Course.

This disease was first differentiated by Gibert and has been chiefly written about by the French school, especially Bazin, Hardy, Horand, and Vidal, but it was not generally recognized until Duhring of Philadelphia and Behrend of Berlin published their observations on the subject.

The disease is rather uncommon, about five per thousand, but no doubt it often escapes recognition except by dermatologists. If it were not for the errors in diagnosis to which it may give rise, it would not be an important disease.

The eruption occurs in patches (P. maculata), from which, by central involution and marginal extension, circles (P. circinata) may be produced. The lesions are barely elevated above the surface, and are generally of a very pale red tint, and the scales, which are extremely fine and delicate, are often oval rather than round, and are arranged on the body with their long axis horizontal.

The patches for the most part do not exceed one inch in their longest diameter unless they are compound, but they develop from small, pinhead-sized, flat papules or spots which in the most acute cases are very numerous, and lesions of all sizes up to the one-inch patch are present simultaneously. When they remain solid, as they do in many cases, throughout their existence, the condition Duhring called pityriasis maculata is produced; but in other cases, when they get to about one-third of an inch across, involution commences in the centre and a ring is produced, and this may enlarge by peripheral extension *pari passu* with central involution. When a patch has faded as a whole it leaves a faint fawn-colored stain. There may be some itching of the eruption, but it is never very marked, and there are no other symptoms of the eruption or attending its evolution as a rule; but slight febrile symptoms have preceded the development in a few cases, and the author has also observed in such cases the tonsils

swollen and reddened and the glands behind the sternomastoid and in other parts of the neck slightly enlarged.

The course of development is as follows: A primary plaque, as was first pointed out by Brocq, is often to be observed on some part of the body, perhaps for eight or ten days before the rest of the eruption. Probably it is always present, but is sometimes unnoticed by the patient. This plaque enlarges no doubt, but is otherwise unchanged, and then suddenly a large number of fresh patches are evolved on both sides of the body. These may appear on either the upper or lower part of the body, and fresh lesions appear almost daily until the whole of the trunk and much of the surface of the limbs are involved. But the author has never observed the eruption on the hands and feet; as a rule it does not extend below the upper segments of the limbs. The face is seldom much involved, although the rash is frequently abundant on the neck. Probably the upper portion of the trunk is more often affected than the lower part, but it is not uncommon to see it developed to a high degree on the abdomen. The extension may stop short at any point—*e.g.*, be limited to the upper part of the chest—but as a rule the eruption is extensive and the lesions are very numerous. After remaining for from three to six weeks, in the majority of cases the eruption begins to fade and disappear in the order of development, so that there may be stains, and fading and relatively bright patches simultaneously present. In some persons the eruption is much more persistent, and in a few cases has lasted for five or six months.

Etiology.

It may occur at any age—seven months and seventy years were the extremes in the author's experience, but one-third of the cases occur in childhood. Neither sex, position in life, nor season has any traceable influence. The disease can scarcely be considered contagious, though in a few instances more than one member in the same family have been affected, and Peroni records an epidemic of it. Practically nothing is known as to its etiology.

Pathology.

The mode of development—viz., rapid generalization on both sides of the body simultaneously from a single primary patch—suggests that the disease is due to a micro-organism which is absorbed into the circulation and distributed in the skin. The symmetry and suddenness of the first development are inconsistent, in the author's opinion, with the hypothesis of an organism being sown over the surface solely *ab extra*. Still less are the clinical facts consistent with the

view of Hebra and still maintained by Kaposi that the disease is only a variety of tinea circinata. Kaposi says that it is not until the second or third week that many spores are to be found in the scales of larger patches with "characteristic, usually short, but occasionally very beautifully developed mycelia." This description, it appears to the author, must belong to a different affection, and at present few authors of repute, except Lassar, share Kaposi's views. Vidal described a micrococcus-like organism, which he designated "microsporon anomœon." Although many observers have failed, further research is desirable for the identification of the organism which, it can scarcely be doubted, produces the disease.

The most recent and careful investigations on this point are those of Oro and Mosea. In the scales they found non-specific organisms corresponding to (1) Bacillus subtilis; (2) Staphylococcus pyogenes aureus; (3) Streptococcus pyogenes. Their investigations were made by cultivation experiments and inoculation of animals. Bacteriological examination of the tissues and of the blood were negative. They regard the disease as a pseudo-exanthem.

Diagnosis.

The presence of a primary plaque (if traceable) and the subsequent extensive development after a short interval are very significant. The presence of a pale red, very slightly scaly eruption in all stages, from a small, flat spot to a patch or ring an inch or more in diameter, usually widely spread over the trunk and upper segments of the limbs with only slight itching, are the most characteristic features. Differentiation may be necessary from tinea circinata, psoriasis, the secondary scaly syphilide, and seborrhœa papulosa.

The primary plaque is most likely to be mistaken for *tinea circinata*. Both are sharply defined and scaly, but there is less elevation in pityriasis rosea and no papular element in the construction of the plaque is discernible. Subsequently the general picture is very different. Tinea circinata never develops from such a large number of centres at once; it is rarely widely spread with a large number of lesions, and the asymmetry, except in the axillæ and groins, is very striking.

The distinction from *psoriasis* is easy. The patches of pityriasis rosea are not so elevated, red, or scaly, and the scales are extremely delicate and detachable. The distribution, too, is very different. It is true that psoriasis may be absent from the elbows and knees, but it is very unlikely to be so in a case where the lesions are so numerous and widely spread as they are in pityriasis rosea. When the scales are scratched off a patch, there will be none of the characteristic bleeding points of psoriasis.

The early *squamous* and *circinate syphilides* would be most likely to be mistaken when seen in a child with acquired syphilis, as the idea of that disease might then not be suggested to the mind of the observer. If syphilis were thought of, there would almost surely be corroborative evidence in the concomitant symptoms and in the more marked staining left by the lesions.

In *seborrhœa papulosa*, formerly known as lichen circinatus, the localization is mainly in the centre of the chest and back, and although occasionally there are more widely spread cases, the limbs are scarcely ever attacked. The lesions are developed from small groups of papules, and even in the circles the papular character of the border is evident and the color is a much brighter red.

Prognosis.

This is favorable, as, with very few exceptions, the disease tends to get well spontaneously.

Treatment.

In view of its spontaneous retrogression, treatment is not very important, the recognition of the disease from more serious diseases being the most material point. Whether treatment has any effect is always difficult to say definitely in a disease with naturally a short course, but latterly the author has thought that the internal administration of salicylate of sodium or salicin, gr. xv. three times a day, had an expediting effect. One case which had been present for five months without any change for the better got rapidly well after the administration of sodium salicylate was commenced. Sponging the surface with a lotion of liquor carbonis detergens and liquor plumbi subacetatis, of each two drachms, distilled water to eight ounces, relieves itching and seems to have a favorable effect on the eruption. Such measures also have an encouraging effect on the mind of the patient.

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PAPULAR AFFECTIONS.

BY

L. BROCQ,

PARIS.

PAPULAR AFFECTIONS.

CONFORMING to the general plan of this work and adopting without needless discussion the classification which has been proposed by the editor, we shall describe successively under papular affections of the skin the various lichens and prurigo. Nevertheless, some explanations are necessary. As one will see upon reading the article entitled lichen, this word has at the present time lost its former significance; it is now used especially to designate lichen ruber in its different varieties.

The word prurigo has, since the works of F. Hebra made their appearance, equally lost the sense it had in Willan's day, and we reserve it almost exclusively for a quite special and well-defined dermatosis. We believe, however, with some others that there is reason to include in this type an affection which E. Vidal described in 1886 under the name of acute lichen simplex, and which, in accordance with the researches of Tommasoli, we have called prurigo simplex.

Furthermore, we shall describe, according to the plan of this work, two other dermatoses of a papular nature which are quite different and which go together with the preceding affections only because their elementary lesion seems objectively to be a papule. These dermatoses are pityriasis rubra pilaris and lichen scrofulosorum. Thus we shall successively study in this chapter:

1. The lichens;
2. The prurigos;
3. Pityriasis rubra pilaris;
4. Lichen scrofulosorum.

I. THE LICHENS.

Introduction.

In studying the subject of lichens in the various works on dermatology, one is struck with the fact that the term has a very different signification, in the works of the older English and French authors, such as Willan, Bateman, Biett, Cazenave, Schedel, Rayer, Devergie,

Gibert, Bazin, from that which it has in those of the head of the Vienna school, F. Hebra, and of his numerous pupils.

For the first-mentioned writers, the lichens were dermatoses characterized in their period of full development by agglomerated or discrete papules more or less pruriginous, and accompanied at a certain period of their evolution by a thickening of the skin with an exaggeration of its natural folds. This definition, which is too vague, led them into classing in this group the most diverse affections. This conception of the lichens was not in a position to withstand criticism.

It has been demonstrated that their lichen pilaris should be placed alongside of ichthyosis under the name keratosis pilaris; that their lichen urticatus should be attached to urticaria; their lichen tropicus probably to sweat-gland eruptions, etc.

Drawing inspiration from certain of their works, particularly from those of Cazenave, Hebra has, however, made of their lichen agrius and their prurigo mitis et formicans, a distinct morbid entity to which he has given the name *prurigo* (see the following section). He has classed as eczemas all the other instances described up to his time under the name of lichen simplex, acute and chronic; lichen circumscriptus, etc. At the same time that he did away with the old group of lichens, the chief of the Vienna school reconstructed under this name a new class of affections characterized, according to him, by the fact that the papules are not simply constituted, but that they have a typical form, and that they persist during the whole course of the affection without ever becoming transformed into lesions of a greater degree of efflorescence, such as vesicles and pustules; they accomplish their whole evolution under the aspect of papules (Hebra and Kaposi).

Relying upon this principle laid down by its founder, the Vienna school has reserved even to the present time the name of lichen for two affections: 1. *Lichen scrofulosorum*, which recent works seem to have classified among the cutaneous tuberculoses, and which therefore we ought now to describe apart; 2. *Lichen ruber* and its varieties—*planus, acuminatus, obtusus, moniliformis, corneus, atrophicus*, etc. This is the only affection which to-day is regarded by dermatologists as truly worthy of the name of lichen.

This reform instituted by the Vienna school has been accepted, almost without discussion, by all French and other dermatologists. E. Vidal alone, in 1886 and 1889, protested against this classification, claiming the right of existence for the dermatoses to which he had given the names of acute lichen simplex and of chronic lichen simplex. Founding his claim upon the incontestable rights of priority he wished to preserve the name of lichen for the affection which

F. Hebra had called prurigo and which he had called *lichen polymorphe ferox*. His attempts failed in spite of their being well founded. Although I am his direct pupil, and in spite of having been his collaborator in all his efforts, I do not desire to perpetuate an unending debate which can only serve to cause contention, and hence like all other dermatologists I designate under the name prurigo the lichen polymorphe ferox of E. Vidal. In common with Tommasoli I recognize that the acute lichen simplex of our venerated master bears a close relationship to Hebra's prurigo, and I describe it alongside of the latter under the name of acute prurigo simplex. As to the chronic lichen simplex, I have shown, together with Jacquet, that this dermatosis forms really a type by itself, and that by its etiology and pathology it should be designated under the name of *névrodermite chronique circonscrite*. One should therefore find its description in the chapter on dermatoneuroses.

It only remains for us to explain why this question of the lichens has remained so obscure, and why authors have advanced so many diverse opinions. We were the first, I believe, to point out clearly the causes of error which the creators of the old group of lichens had to contend with. In founding it they relied upon a symptom which they regarded as characteristic, while in reality it is secondary and inconsequential. I refer to the thickening and infiltration of the integument, the quadrilateral markings, and the fine and adherent desquamation. This aspect, which led them to give to these affections the name of lichen, and which was for them pathognomonic of the group, is in reality only a morbid process of the most general kind; it is consecutive to incessant traumatisms, particularly to the scratching which these patients indulge in. Indeed, whenever one continually produces any form of traumatism at a given point of the integument, the skin thus injured undergoes little by little modifications in its appearance, its texture, and its function. Especially when the skin is already in a morbid state, the traumatisms produced upon it lead with greater or lesser rapidity to the development of lesions of considerable importance. Particularly in the cases where there is itching and the pruriginous area is incessantly injured by scratching, either with the nails, the clothing, or perhaps with some instrument, alterations in the skin may be brought about, which, as Jacquet has shown, consist essentially in a chronic inflammation of the skin. The derma becomes little by little infiltrated with embryonal elements, thickens, becomes hard and rough; the papillæ hypertrophy and even at times group themselves in such a fashion as to simulate quite irregular and unequal papules, having no precise relation with the pilo-

sebaceous nor with the sudoriparous apparatus. Soon the skin presents a special aspect characterized by an exaggeration of its natural folds, which form a sort of network with more or less large and regular meshes, and by a more or less accentuated infiltration of the skin, which has lost its suppleness and normal consistence. This is the morbid process to which we have given the name *lichenification.**

Now, and this is the chief point of this question, lichenification can be produced either in a healthy skin, at least one that is so objectively, or in a skin already affected with a preceding dermatosis. In the first case it constitutes by itself the whole cutaneous lesion; it is pure and primary. In the second case it is secondary to a preceding eruption which it may modify, transform, or complicate.

It may be observed indeed in the most diverse morbid states and should be looked upon only as a syndrome; it cannot characterize by itself alone a well-defined pathological group or become the basis of a classification. It is because dermatologists did not understand its real value that they committed so many errors in regard to it. Some seeing it frequently coincide with an eczema believed that in all cases it was connected with this disease, and considered it as a simple variety of eczema; others having observed incontestable instances in which the process of lichenification was produced from the outset without other preceding dermatosis, attributed to it too great an intrinsic importance, and had too great a tendency to regard all the cases of different nature in which they observed it, as varieties of a special morbid type to which they gave the name of lichen. Such is the key to all the confusion, which has served to obscure this question. That which precedes shows us that we can divide the cases in which lichenification is observed into two chief categories: 1. Those in which lichenification is the only cutaneous lesion appreciable to the naked eye; these are our *primary* or *pure* lichenifications; 2. Those in which the lichenification, consecutive to scratching, develops upon a preceding cutaneous lesion; these are our *secondary* lichenifications.

1. In my various publications I have shown that the primary lichenifications may be circumscribed. Such are chronic, very slow in their evolution, forming more or less extensive plaques of the average size of the palm of the hand, persisting for months and years; they correspond to the lichen simplex circumscriptus of the older writers, and to the chronic lichen simplex of E. Vidal. Jacquet and

* For further details upon this point see my various publications upon this subject, which I can only touch upon here, since it is not within the scope of the present article to go into the question deeply.

I have proven that they deserve the name *névrodermite chronique circonscrite*. We refer the reader for their description to the article on Dermatoneuroses in this volume. We have likewise demonstrated that the primary lichenifications may be diffuse; these cases are quite rare; they have ordinarily a much more rapid evolution than the preceding, and the alterations of the integuments are much more superficial. We have given to them the name of *névrodermites diffuses:* they are almost always acute or subacute.

2. The lichenifications secondary to a persistent dermatosis are of extreme frequence: they are so common that they have till now almost exclusively attracted the attention of observers and have caused the existence of the primary lichenifications to pass unrecognized. We have established the fact that for these secondary lichenoid states to exist it is necessary that the pathogenic conditions which are productive of the primary lichenoid states should be present; it is necessary that the primary cutaneous affection be pruriginous, that it occupy for a considerable time the same region of the tegumentary surface, so that this region shall be sufficiently long subjected to the lichenifactive traumatic action; and finally, it is necessary up to a certain point that the subject himself be predisposed to lichenification.

These diverse conditions are met with very frequently in chronic eczema, especially when it is localized upon the neck, the genital region, the buttocks, the external surface of the limbs, the anterior surface of the wrists, the internal and superior parts of the thighs, or the scalp. The moist vesicular eruption appears; it is pruriginous; the patient rubs it, scratching almost incessantly; little by little the injured integuments become inflamed, and this process goes on; thickening, induration, and lichenification take place, and there are thus produced hard, red plaques which have no suppleness, are thickened, furrowed in a more or less complete and regular quadrilateral manner, lichenified in a word, but upon which area there exist at the same time a few vesicles disseminated here and there; there is an oozing, there are crusts, that is to say, there exists an eczematous state. This is the lichenoid eczema of authors, but which I have called lichenified eczema.

We observe again the same process in certain artificial eruptions, in certain cases of pruriginous psoriasis, where under the influence of scratching we see the skin thicken and lose its typical aspect of psoriasis; in certain instances of pityriasis rubra, of mycosis fungoïdes, of lichen ruber (see further on), etc., but especially in the affection now called prurigo, and which in France is called the prurigo of Hebra. It is indeed in this dermatosis that the lichenification ele-

ment attains its maximum of importance. It corresponds to the lichen agrius of the older writers, and to certain lichenoid eczemata. E. Vidal wished to apply to it the very characteristic name of lichen polymorphe ferox. We shall describe it below in the section on "Prurigo."

We limit ourselves to these few considerations, unfortunately brief, for we cannot here relate the complete history of lichenification which constitutes a chapter by itself of general pathology of the skin. What we have just said suffices nevertheless to demonstrate that we should no longer describe in the group of papular affections the majority of the lichens of the older writers. Now that we have let in some light upon this point, hitherto a little too much neglected in modern works, we shall enter without further discussion upon the description of lichen ruber and of the prurigos.

Lichen Ruber.

History.

It was most probably our great French dermatologist, Bazin,[1] who first described the affection which we now call lichen ruber. His *lichen pilaris* by functional alteration corresponds in fact to a dermatosis, characterized by small papules depressed in their central part, of a yellowish or brownish color, usually arranged in more or less extensive plaques; these plaques resemble a crust of bread slightly burned and superficially grated. This description agrees in all points with that of lichen ruber planus. It was F. Hebra[2] who first created the term *lichen ruber* to designate a dermatosis characterized "by the formation of papules which remain in the same condition during the whole course of their existence, and undergo no modification, unless the subsequent appearance of new papules may determine their reunion in circumscribed plaques; the papules themselves and the plaques which result (provided they do not become covered over with epidermic masses) present invariably an intense deep-red coloration." Hebra had observed, he said, fourteen cases of the affection of quite long duration terminating in death. This description, which is most obscure, has been the origin of endless discussions, which do not seem likely to come to an end soon. With Erasmus Wilson[3] we enter upon a most fruitful phase of clinical observations. This celebrated English dermatologist gave indeed the first truly scholarly description of a morbid type which from an objective view was most clear, and which he called lichen planus. Unfortunately he thought he recognized in this dermatosis the lichen ruber of Hebra—a supposition which according to our views is in no wise justified and which authorized the Vienna school to consider Wilson's lichen planus as a simple variety

of lichen ruber primarily described by F. Hebra. From that time on this author and his celebrated disciple Kaposi taught that lichen ruber comprises two principal forms:

1. *Lichen ruber acuminatus*, first described by F. Hebra, characterized in an objective sense by disseminated papules, very firm, the size of a millet seed or the head of a pin, red, conical, having at their summit a small, thick epidermic scale, and which end by becoming confluent and forming diffuse red and scaly surfaces.

2. *Lichen ruber planus*, in describing which they did not mention the name of E. Wilson in their original writings, although this is purely and simply the affection so well described by the English author. In 1876 Colcott Fox published (*Lancet*, 1876) an interesting observation on lichen planus which one might confound with a papular syphilide; in 1879 [1] he advanced for the first time the hypothesis of the neuropathic nature of this dermatosis, a hypothesis which was taken up later on in France. In 1880 Köbner published several instances of rapid cure of lichen ruber by subcutaneous injections of arsenic. In 1881 L. Duncan Bulkley [2] called attention to lichen planus of the penis; Hutchinson, Pospelow, Neumann, Crocker, Köbner, Thibierge, Mackenzie, Mayor, Pautry, and others studied from 1879 to 1886 the buccal manifestations of lichen planus which Erasmus Wilson had already mentioned. In France the "Lessons" of E. Vidal appeared in 1878–1880. The theses of Héguy (1880) and of Lavergne (1883) upon lichen planus were publications which fixed the clinical side of the most frequent variety of this disease. The various works of Vidal and of Leloir, of Weyl, of Lemoine, of Chambard (1883), of Köbner, of Bender (1887), of Caspary, of R. Crocker (1888), of Robinson (1889), of Torök (1889), and of Unna (1886–1894) established the pathological anatomy of the affection.

The writings of Jacquet upon the therapeutic efficacy of sedative hot douches in this disease (1891–1892) point to its neuropathic origin. But of all the recent publications upon this subject it is perhaps the memoir of P. G. Unna, which appeared in 1885–1886, upon the clinical history and the treatment of lichen ruber, which has done most for the profound study of the question, by reason of the discussions which it has provoked. According to Unna, lichen ruber includes three quite distinct varieties: (*a*) lichen ruber acuminatus; (*b*) lichen ruber obtusus; (*c*) lichen ruber planus. These three varieties have characters in common permitting their being placed in the same morbid group: they are constituted by papules of livid color, bluish or yellowish-red, hard, of a peculiar dryness, itchy, having a marked tendency to chronicity. From an objective point of view, as we shall see in the section on Symptomatology, these three types

are quite distinct. They seem to be so from a point of view both of their evolution and of their gravity, although they may have between them transition points in common. The chief point of this memoir is the criticism which is made in it of F. Hebra's lichen ruber acuminatus, and the new conception which is given of this morbid form. The lichen ruber acuminatus of Unna is an eruption having most frequently an acute course, characterized by small papules of a diameter of from one to one and one-half millimetres, and of the size of a millet seed or a grain of mustard, conical, tipped with a scale at the summit, which corresponds to the situation of a hair follicle. At first discrete, they may increase in volume and by redness and swelling of the intermediate skin become confluent and thus constitute extended plaques of a bluish-red hue, slightly scaly, and very itchy. If badly treated this affection may be prolonged and constitute a serious disease, indeed one of the most severe, and even terminate fatally by nervous exhaustion, marasmus, or tuberculosis. The nervous element predominates to such a degree that at the Congress of Paris in 1889, wishing to differentiate his morbid type from that of Kaposi, Unna gave to it the name of lichen ruber acuminatus neuroticus. Taking Unna's memoir as a point of departure, I set myself to demonstrate that the lichen ruber acuminatus of F. Hebra could not withstand a serious analysis; and re-editing that which I had already written in 1882, in my work upon generalized dermatitis exfoliativa, and in 1884, in that upon pityriasis rubra, I endeavored to prove that most of the cases called by Hebra lichen ruber acuminatus were very probably instances of the affection described four years before in 1857 by Devergie in France under the title of pityriasis pilaris (pityriasis rubra pilaris of Besnier and Richaud). Coming back to this same question in 1889, in view of the publications of Taylor upon lichen ruber in America, I showed in the most irrefutable manner that the superb plates of the American dermatologist and his beautiful clinical descriptions were typical of our pityriasis rubra pilaris. These views were confirmed in the clearest manner a short time afterward, at the Paris Congress. Kaposi indeed agreed that the wax models of pityriasis rubra pilaris in the museum of the Hôpital St. Louis corresponded exactly to his lichen ruber acuminatus. One would have thought that this declaration would have had a decisive effect and that the identity of the pityriasis rubra pilaris of the French and the lichen ruber acuminatus of F. Hebra was established definitely, but such was not the case.

Unna at first explicitly declared that his lichen ruber acuminatus had nothing in common with pityriasis rubra pilaris; moreover, all the German dermatologists did not accept the identification made by

Kaposi (see regarding this question the report of Neisser upon lichen at the Rome Congress of 1894 and the discussions of the Dermatological Society of Vienna, 1893–1894). Neisser, Neumann, and Lang in particular declared that we must admit a pityriasis rubra pilaris along with a lichen ruber acuminatus of Hebra, and a lichen ruber planus. For them the true lichen ruber acuminatus differed from the pityriasis rubra pilaris in that the skin is harder to the touch, the derma is infiltrated, there exist true anatomical papules, and there is a more or less profound implication of the general system, which is not the case in pityriasis rubra pilaris.

It seems then actually proven that Devergie, Besnier, and Richaud described in France, under the name of pityriasis rubra pilaris, the same affection that F. Hebra and Kaposi described in Vienna under the name of lichen ruber acuminatus. The priority belongs without any doubt to Devergie, who in the second edition of his practical treatise upon diseases of the skin (1857) gave the first precise description of this affection. Subsequent studies have shown that it could take on the most diverse forms, and present appearances the most unlooked for. It is thus easily understood how dermatologists could make of two varieties very different of aspect two distinct dermatoses. We believe, however, that little by little new studies and a wider conception of the facts will permit of its being admitted as a universally acknowledged truth that pityriasis rubra pilaris and lichen ruber acuminatus of Hebra-Kaposi are identical. We shall therefore not describe in this article the lichen ruber acuminatus of F. Hebra, but shall describe it in another section under the French name of pityriasis rubra pilaris. From another side it seems also demonstrated that there exists another morbid form worthy of the name of lichen ruber acuminatus (Neisser) or of lichen ruber neuroticus (Unna). We shall here describe lichen ruber planus and its varieties, comprising the lichen ruber acuminatus neuroticus of Unna, thus passing successively in review—

(*a*) *Lichen ruber planus* properly speaking; its acute forms, its torpid forms, its generalized forms;

(*b*) *Lichen ruber obtusus* and its various forms;

(*c*) *Lichen ruber acuminatus neuroticus*;

(*d*) *Lichen ruber corneus*;

(*e*) *Lichen ruber planus atrophicus.*

Lichen Ruber Planus.

Symptoms.

Lichen ruber planus (lichen planus of E. Wilson, which is still often called lichen of Wilson) is a dermatosis, well defined objectively by a characteristic elementary lesion, viz., a small papule having a red color bordering on the yellow, of irregular form, polygonal, sharply limited, with flattened surface, brilliant under oblique rays of light.

When these papules first appear, they are small, of the dimension of a needle point, scarcely colored but already brilliant. In order to see them one must look very attentively through a magnifying glass, and especially must one vary the angle of incidence of light upon the skin surface. At this epoch they can scarcely be surely diagnosticated from the initial lesion of primitive diffuse lichenification (see the introduction). They soon increase in volume, attaining the size of a pin's head, of a grain of hemp, very rarely of a small lentil; the usual dimensions are those of a small, of a medium, or of a large pin's head.

Unless they become confluent they are limited, sharp cut, precise as though designed with the point of a needle; very rarely they are rounded and nearly always they are limited by polygonal lines which cross each other usually at obtuse angles, much more rarely at acute; when this effect is produced it is probably due to the confluence of two small elements closely situated one to the other. Their coloration is a little variable according to the case and according to the course of the affection; it is habitually of a clear red, a little bistre at times, occasionally yellowish and discolored; in the acute forms it may be of a bright red, even scarlet; in the torpid forms it takes on a grayish tint.

These papules are hard, dry, and stand out in very slight relief upon the integument. They are flattened, brilliant, like drops of wax, and reflect the oblique light in a manner absolutely characteristic. In the centre one sees occasionally a sort of umbilication, caused, according to R. Crocker and Robinson, by the desquamation of the corneous cone which forms in the upper portion of the excretory canal of a sudoriparous gland around which the papule has developed; according to Torök, on the contrary, "this umbilication of the small papules is caused by the fact that their median portion is held back by the duct of a sudoriparous gland, more rarely by a hair follicle, while the neighboring parts are raised up by the swollen papillary body."

Once developed the papules do not increase indefinitely in extent; they are in this respect quite different from the elements of psoriasis. They never exceed two or at the utmost three or four millimetres in diameter, but they may multiply indefinitely. Alongside of the first papules others form in more or less close proximity, perhaps being close enough to each other to become confluent, forming more or less extensive areas. From this point they produce modifications which we must study.

So long as the papules of lichen planus are isolated (lichen planus discretus) they present few points of desquamation. So soon as they become confluent they lose on the other hand their smooth and shining aspect. From now on the lesions may evolute in various ways. When lichen ruber planus has a slow or chronic evolution the papules form by confluence plaques of only limited extent, from 4 mm. to 1 cm. and more in diameter, of a brownish-red color, flattened, projecting slightly but more or less noticeably above the level of the skin; their borders, ordinarily quite irregular, are projecting, their centre is depressed, and this central sinking in is due, according to Torök, to the depression of the papillary body produced by the enlargement of the epithelium and by the cornification and the desquamation of its upper parts. In fact, the surface of these plaques is covered with fine scales, gray, adherent, which scratching renders more in evidence. These are for certain authors the typical elements of lichen ruber planus, and according to them they may form rapidly, or gradually by confluence of the primary elements which we have already described. Their general configuration is rounded, oval, or plainly irregular. The derma is more or less thickened at their site. At times (according to Wickham always) after the scales have been caused to disappear, one sees upon the surface (particularly upon the anterior surface of the wrist) whitish striæ upon a reddened base, recalling a little the aspect of lichen planus upon the internal surface of the cheeks. Wickham has quite recently studied this syndrome. He minutely described the various aspects of these striæ, which may form in the shape of stars, lines, and figures, and he thinks we have here an objective feature which is pathognomonic of lichen ruber planus. In some cases and in certain regions, in particular about the genital regions, upon the lower abdomen, upon the lower parts of the legs, and upon the forearm about the articular folds of the elbow and axilla (E. Wilson), the lesions of lichen often group themselves in an annular, more or less geometric form. The centre is depressed, rarely healthy in appearance, more often pigmented (lichen planus annulatus). The appearance recalls in general that of the circinate syphilides, with which this form is almost always confounded by the ma-

jority of practitioners. When a portion of the circle disappears and the neighboring circles join together we have the variety to which the name *lichen planus marginatus* has been given.

When lichen planus has an acute inflammatory course, which is quite rare, the papules are produced with extraordinary abundance; they are of a vivid red color, at times globular, or quasi-hemispheric, and their brilliant facets are less clearly defined or do not exist at all; they are quite frequently interspersed with small acuminate elements, and they may form in a few days by confluence vast red areas in which the derma is thickened and lichenified, and which are the seat of a quite abundant desquamation. One would at times say even that there had developed a sort of exfoliative herpetic condition consecutive to the lichen planus (see the works of Buchanan Baxter upon dermatitis exfoliativa, 1879). This is the *lichen planus acutus* of Lavergne, a variety in which it is not rare (especially when the general condition of the patient is not good) to see pemphigoid bullæ appear here and there disseminated upon the preëxisting lesion or even upon the healthy skin.

The *localizations* of lichen ruber planus are, in their order of frequency, the anterior surface of the wrists, the forearms, the lower portions of the abdomen, the lumbar region, the neck, the lower extremities, the genitals, the lateral surfaces of the trunk, the palms and soles, the buccal mucous membrane, the scalp.

There have been published cases in which the eruption had a zoniform localization over the region of distribution of a nerve. Some of these localizations modify the physiognomy of the affection. This is the case in the palms of the hands and soles of the feet, where the papules at first may resemble yellowish-white stains situated below the corneous epidermis. They simulate vesicles and vesico-pustules, and nevertheless, if the epidermis is scraped off with the fine point of an instrument, it is seen that not the slightest vestige of liquid is present; the epidermis is dry and shows a tendency to desquamate. The evolution of the lesions takes place after this in various ways. In certain cases they become confluent; the epidermis is detached in plates of more or less considerable size, leaving exposed a red, more or less livid surface, surrounded by an irregular border of yellowish cornified epidermis in a state of desquamation. All around are found isolated or confluent elements covered or not with their epidermis. It is truly difficult in this case to distinguish the lichen planus of the palm from psoriasis, dry eczema, syphilides, or palmar keratodermias. In other cases each element desquamates by itself, and little isolated points are produced whose borders are formed of horny epidermis, of yellowish aspect, in a state of desquamation. In places these

lesions may become confluent. The palm then presents a quite characteristic worm-eaten aspect. In other cases, finally, each element appears under the form of a sort of almost colorless elevation, bearing at its central part a blackish depression, punctiform, which seems to correspond to the orifice of a sudoriparous gland. But we cannot dwell longer on these details. Lichen planus may be observed upon the penis and upon the glans, but it is especially upon the mucous membrane of the mouth that it presents a peculiar aspect.

Upon the tongue it forms plaques or bands more or less extensive and irregular, ordinarily multiple, situated upon the dorsal surface of the organ or at times upon the borders, of pearly whiteness, resembling at first sight plaques of true leucoplasia, but seen to differ notably when a close examination is made. In fact the patches are constituted by a sort of thickening of the lingual epidermis, which submerges, so to speak (Mayor and Pautry), the papillæ of the tongue, which are no longer visible although still present. At times, on the contrary, the papillæ are actually less developed at the site of the lesions, and they may even undergo a process of real atrophy. Indeed, lichen planus of the tongue almost always resembles the lesion which is produced upon that organ by slight cauterization with nitrate of silver.

Upon the cheeks this affection has an aspect still more pathognomonic. There it forms tracts or bands of dull white, slightly raised, at times looking as though depressed, and puckering the mucous membrane, which takes on a pseudo-cicatricial appearance. They present here and there elevations or, better, dilatations which simulate papules, and they coalesce in various ways so as to form more or less irregular stars when the disease is fully developed.

Subjective Phenomena.

The local sensations experienced by the patients affected with lichen ruber planus are most variable. In some subjects, especially in the torpid forms, they are negative or practically wanting. In the great majority of the cases they are quite accentuated and consist in continuous or intermittent pruritus, subject to paroxysmal increase in intensity, so that at times the patients are exhausted by the insomnia occasioned. These are for the most part, however, neuropathic subjects, and the dermatosis undergoes changes due to the state of their nervous system.

Lichen ruber planus is one of the dermatoses having a very great tendency to complication with lichenification. Under the influence of scratching by the patient the eruption develops, new elements appear, every excoriation becomes covered with a series of papules. Then the skin thickens, hardens, becomes infiltrated, lichenified in

a word, and this frequent complication transforms the characteristic aspect of the dermatosis; so much the more as, alongside of the true eruptive elements of lichen planus, lesions may be produced analogous in aspect to diffuse lichenifications. This influence of scratching upon the genesis of the elements, so long as the subject is in the eruptive period, and its influence upon the ulterior modification of the appearance of these elements, has led authors, Jacquet in particular, to think that the eruption of lichen ruber planus is always secondary to scratching. "It is not," he says, "the cutaneous lesion which is pruriginous, it is the pruritus which is pre-eruptive." We shall see further on whether we should adopt in its totality this ingenious theory.

Evolution.

Typical lichen ruber planus goes through its evolution with the greatest slowness. It may persist almost without modification during months or years, aud the patient may even be affected without knowing it; but these are the rare instances. Almost always the eruption spreads slowly, but progressively, either in a quite uniform manner, or undergoing from time to time, as it were, slight acute exacerbations which in many cases seem to coincide with moral shocks, over-fatigue, in a word with some form of disturbance of the nervous system. This is the most ordinary form, the one which might be called *subacute* in opposition to the preceding, which is truly chronic or torpid.

Sometimes on the contrary, as we have already seen, lichen ruber planus develops with rapidity; the papules are red and inflamed-looking, seeming as though tumefied; they present themselves, one alongside of the other, in such a way as to form extensive red areas and cover the body almost wholly in a few weeks or in a few days. This is the acute lichen planus of Lavergne, which may even in some very rare cases become generalized in such a way as to simulate a dermatitis exfoliativa.

There has also been described a form special to infancy (Colcott Fox, Radcliffe Crocker, *et al.*) which is characterized by an acute evolution, an eruption of papules which are at first acuminate and then become flattened, which are produced in groups, which are very pruriginous, but which disappear with rapidity under the influence of calming applications. It is more frequent (Crocker) in infants who perspire abundantly.

Complications.

We have already pointed out the possibility that lichen ruber may become complicated with an eruption of pemphigoid bullæ. This

complication, which is by the way of extreme rarity, has not seemed to me to have at all times the gravity which certain dermatologists have attributed to it; it has seemed to coincide in some cases with albuminuria or diabetes. I will not discuss again the coexistence of lichenification in the majority of cases of lichen ruber planus, but would point out the frequency of an eruption, of equally neuropathic origin, which quite often complicates and at times even masks the elements of lichen ruber planus—I speak of urticaria. It has at times been difficult for me to discover the characteristic papules upon the skin tumefied by urticaria and lichenified by scratching, and, without insisting too much upon these somewhat isolated cases, it is well to know that the many neuropathic subjects affected with lichen ruber planus, subacute and pruriginous, are at the same time predisposed to outbreaks of urticaria.

Course.

Abandoned to itself lichen ruber planus may undergo spontaneous cure after a variable, but usually quite prolonged period. The papules and plaques then undergo a gradual process of regression; the centre becomes depressed and pigmented. At times there remains a quite apparent small cicatrix; then the color, at first brownish, almost black in some subjects, loses little by little its intensity, becomes a clear brown or *café au lait*, and can even reach a state of depigmentation such as to make the last vestiges appear like whitish depressions, almost pearl-like and as though cicatricial. Most frequently it is a *restitutio ad integrum* of the integuments which takes place.

Prognosis.

The prognosis is in the main benign, except when the general condition of the patient is bad, either from a neuropathic point of view, or from the side of the kidneys. Thus one should always examine the urine of subjects affected with lichen ruber planus and take an exact accounting of the shocks which the nervous system may have undergone.

Pathological Anatomy.

The various authors who have studied the pathological anatomy of lichen ruber planus are scarcely in accord with each other. It would be necessary to enter into details, which the general plan of this work does not permit, in order to give an understanding of the differences which separate the investigators. We shall content ourselves then with the statement that the lesions in the beginning of lichen ruber planus are produced by an infiltration of round cells,

analogous to leucocytes, round and especially above the subpapillary vascular network. This infiltration develops along the course of the capillaries of the papillæ, increasing more or less rapidly in intensity according as the morbid process is more or less acute. "Between the round cells are to be seen at first the fibres of the papillary bodies, the enlarged lymphatic spaces, and the fixed cells swollen by œdema. Soon appear the ramified pigmented cells which are seen especially in the neighborhood of the vessels. The infiltration of the round cells finally almost completely fills the free space between the subpapillary network and the subepithelial layer" (Torök). It is now understood that the papillary body undergoes important modifications: the swollen papillæ increase in all directions, compress the interpapillary epithelial cones, and deform them. At times the cellular infiltration is so abundant in the acute forms that it raises up the mucous body and compresses it, constituting by itself alone the papular projection (Crocker).

The epithelium presents an inflammatory œdema of moderate degree, indicated by the enlargement of the interepithelial lacunæ of its inferior layers and by the infiltration of migratory cells. The epithelial cells have a pale color. All the modifications undergone by the epithelium in consequence of this compression have been admirably described by Torök, to whose work we refer the reader for further details. "The brilliancy of the papule is caused by the raising up, the tension, the parallel arrangement of the epidermic layers, and the infiltration added to the tension is the cause of the firmness of the papule."

R. Crocker dwells especially on the fact that the papule of lichen planus develops almost always round the duct of a sweat gland in the upper layers of the corium. It is quite often found that a healthy hair follicle is in the neighborhood of the papule. At times, however, the hair follicle is engulfed in the morbid process; it may even be found in the centre of the cellular infiltration.

The epithelium is usually thickened, especially when the morbid process is not very acute (Crocker). In this case the Malpighian cells proliferate abundantly, compress in their turn the cellular infiltration of the corium, and enter to a great extent into the constitution of the papule. The horny layer is ordinarily very little thickened excepting at times near the centre of the papule. Here it forms, according to Robinson and Crocker, a sort of cone, whose summit dipping into a depression of the rete Malpighii corresponds to the sweat duct; the desquamation of the epidermic cone explains, according to these observers, the central umbilication of the papule.

According to Torök this umbilication is most often occasioned by

the fact that the centre of the papule is held down by the duct of the sweat gland having its opening at this point, or else by a hair follicle found in this situation, while the neighboring parts are raised up by the papillary body.

In proportion as the papule becomes older the epithelium proliferates more and more. It seems that the papillæ at the centre of the papule have equally a tendency to disappear more and more as the lesion progresses. Under the same circumstances the stratum corneum increases in thickness. It is thus that Torök explains the central flattening of the large papules; the papillary body is in fact depressed in the centre, where the process has existed longest, and the horny layers are in active desquamation.

THE PRINCIPAL OBJECTIVE VARIETIES OF LICHEN RUBER PLANUS.

A. All that precedes had to do with *true lichen ruber planus*, which should be considered as the prototype of the group. We shall now pass rapidly in review the other clinical types which should be classed alongside of it.

B. Lichen Ruber Obtusus.—In his memoir of 1884–1885, Unna gave this name to one of the three great classical forms of lichen ruber which he recognized. According to my view we should group under this denomination the three following sub-varieties:

(*a*) *True Lichen Ruber Obtusus.*—It is constituted by an eruption of papules of medium size of from 3 to 5 mm. in diameter, reaching at times the volume of a pea, semicircular, hemispherical, semiconical, or flattened at their summit, smooth, without scales, closely resembling transparent wax, often bearing at their central part a slight depression, and varying in color from a bluish to a brownish-red. This dermatosis, which I have observed in an infant, seems to be quite rare. It is not very pruriginous and may remain circumscribed, but it can also spread in a few weeks over the whole body and form large plaques by confluence of neighboring papules. When cure takes place there remain quite frequently at the site it has occupied elements of a brownish pigmented hue, at times even a slight cicatrix. This is the form described by Unna under the name of lichen ruber obtusus. According to him it may exist in a pure state or its characteristic elements may in some patients be mixed with elements of lichen ruber planus or acuminatus.

(*b*) *Corneous Lichen Ruber Obtusus.*—This variety, which one might also call *lichen corneus disseminatus*, is also very rare, and I personally have seen but three cases. It is constituted by quite large papules, from 3 to 10 mm. in diameter, which are mostly situated upon the

upper and lower extremities. They begin in the form of rounded or hemispherical papules, faintly tinged with rose, and which are very itchy. These elements increase in size very slowly, and as they grow they take on a brownish or rather a *café au lait* color, more or less pronounced according to their development, and become covered in the centre and then over their whole surface with fine scales, dry, grayish, very adherent, which become stratified and end by giving to the lesion a horny aspect; nearly all the papules remain discrete. The evolution of the disease is extremely slow. We cannot say surely whether this variety should be attached to lichen ruber or should be ranged among the pure dermatoneuroses. We are tempted to adopt the latter view.

(*c*) *Lichen Ruber Moniliformis.*—I think we should describe along with the preceding types the lichen ruber moniliformis of Kaposi in which the lesions are constituted: 1. By a species of nodosities more or less voluminous, ranged in a linear manner so as to form chains; 2. By flat punctiform papules situated in the intervals of the chains; 3. By brown sepia-like pigmentations disposed in small stains (see for further details the work of Kaposi).

C. Lichen Ruber Acuminatus Neuroticus.—Unna has described under this name a special affection constituted clinically by small papules with acuminate summit, having a diameter of 1 or 2 mm., of the size of millet seeds, covered with adherent scales, developed around a hair follicle, and without central depression. At the onset these are isolated, red scaly points which later increase in volume; the skin which separates them reddens, swells, and thickens; they become confluent and form extensive plaques of a bluish-red color, slightly scaly and extremely pruriginous. This dermatosis has almost always an acute course; it comes on often after profuse sweating. The pruritus is most intense. The patient presents a serious general condition, with extreme feebleness, and an excessive nervous excitability, while at the same time there is depression and prostration. While cure is the rule, still, according to Unna, when left to itself it may take on chronic features and become fatal, the subject dying of marasmus or being carried off by a complication. This morbid form evidently cannot be confounded with pityriasis rubra pilaris.

D. Corneous Lichen Ruber Planus.—The lichen ruber planus corneus of E. Vidal, or *hyperkeratosic lichen*, is an eruptive form essentially chronic, nearly always localized upon the anterior portion of the legs, but observed also in some rare instances upon the thighs, hips, and forearms. It is characterized by plaques of variable dimension, of the average size of a twenty-centime piece (or of a silver half-dollar),

but which may at times become considerably larger. Their form is rounded, ovoid, or more frequently very irregular. Their surface is uneven and seems often to be covered over with numerous openings, corresponding to the openings of sweat ducts or hair follicles, of the size of a pin's point or head, either plugged or not by minute epidermic cones. These plaques are covered with fine gray scales, very adherent, stratified, and thick enough to form here and there sorts of rough masses. Their color is variable, now rosy, now red, and again blue, brown, or even black. The derma at their site is very thick, so that they come to constitute small tumors of several millimetres elevation and with rather well-defined borders. The itching is very often intolerable, but almost always intermittent. This dermatosis has a slow course and lasts for years. It is very common to see in some subjects plaques like those we have just described situated upon the lower extremities and coexisting with characteristic papules of lichen ruber planus developed in the neighborhood or in the points of election. This fact has led certain authors to consider this variety as a simple modification of the true planus type.

E. Lichen Planus Atrophicus.—This variety has been well described by Kaposi and Hallopeau. It is rare, although I have been able to observe at least three cases. It begins by papules, "at first similar to those of ordinary lichen planus, although less colored, and giving rise like them to a sensation of itching; then they become pale, flatten promptly, and thus form whitish patches of cicatricial appearance, which are remarkable from the presence of punctiform depressions. These eruptive elements become grouped and confluent in such a way as to constitute discolored or but slightly colored plaques, at times glistening, of cicatricial aspect, measuring several centimetres in diameter; their surface is covered with quadrilateral lines and studded with punctiform depressions surrounded by a slight epidermic projection. Their outline is irregular; isolated papules are seen at their periphery, some flattened and without color, others still rosy and in a state of activity. These plaques are disseminated over the limbs and the trunk. From a histological point of view this form is characterized by an atrophy of the papillary body with sclerosis of the derma and dilatation of the sudoriparous ducts" (Hallopeau).

F. Mixed Forms.—When we consult the different authors we see that they have for the most part observed cases in which the typical elements of the various forms which we have just enumerated are found in a way mixed. These cases are relatively frequent. Thus it is not rare to find some acuminate papules in a true lichen ruber planus with acute tendency, some hypertrophic horny elements upon

the anterior and external parts of the limbs in subjects long affected with lichen ruber planus, etc. These mixed forms should be almost always considered as cases of true lichen ruber planus in which some eruptive elements are invested with certain unusual aspects.

Diagnosis.

A. The papules at the onset of true lichen ruber planus are so pathognomonic that the diagnosis of this affection, it would seem, ought always to be easy. In some cases, however, it is difficult to recognize it, either because it is complicated with other eruptions, such as urticaria or lichenifications (see above), or because it has in a great measure disappeared, or is in process of regression. In the latter case the consecutive pigmentations, the typical localizations, or some elements less distorted will always permit one to suspect its existence. *Diffused lichenifications* simulate an eruption of lichen ruber planus at its onset in a manner to lead into error. In the former we observe small pearly papules, shining in the incidence of a ray of light, extremely numerous, closely packed one against another. Still they have not the clearly cut borders in the same degree as those of true lichen ruber planus, their surface is not so tense, so smooth, so brilliant, their color is not so frankly clear brownish-red. All these distinctions, however unimportant they may appear to the reader, are real and most important, especially now that the theory of lichenification has been formulated. How often, before being in possession of this notion, have we stood before patients affected with these diffuse lichenifications, and wondered whether the lichen ruber planus would finally assume its typical form!

The affection which, after diffuse lichenification, is most likely to be confounded with lichen ruber planus is *primary circumscribed chronic lichenification* (*Lichen simplex chronique* of E. Vidal, *Névrodermite chronique circonscrite* of Brocq and Jacquet). It is often scarcely possible at the first view to make a positive diagnosis. However, the papules of circumscribed chronic neurodermitis are ordinarily less regular, less clearly limited, less shining, less swollen than those of lichen ruber. E. Vidal a long time ago pointed out the objective resemblance between the two affections.

A quite frequent error consists in taking the eruption of true lichen ruber planus for a *papular syphilide*. The papules of lichen ruber planus have, however, nothing in common with the papular syphilides. These latter have not the brilliant facets, the sharp contours, or the polygonal forms of the initial elements of lichen; they are almost always squamous or squamo-crustaceous either at

their summit, as in the acneiform syphilides (*lichen syphilitique*), or at their periphery as in the papular lenticular syphilides (*collerette de Biett*). Finally they do not give rise in the great majority of cases to any marked pruritus. The confusion between syphilis and lichen ruber planus is much more explicable when we have to deal with the circinate forms which we have studied further back. They resemble so closely the *circinate syphilides* of the secondary period (when a somewhat superficial examination is made) that one must be really familiar with cutaneous affections in order not to hesitate. Lichen planus circinatus will be recognized by the pigmented discoloration of the centre, by the presence of a collar formed by flattened papules, shining, at times a little brownish, often umbilicated, juxtaposed one against another; and especially (but not always) may it be recognized by the absence of a central papule in the very midst of the ring, an important symptom, since the existence of this central papule in the midst of the space encircled by the peripheric papules justifies almost surely by itself alone the assertion that the lesion is of syphilitic nature.

We shall not stop to describe here the differential diagnosis between lichen ruber planus and *lichen scrofulosorum*, a dermatosis marked by a grouping, which is altogether characteristic, of projecting elements, which never present shining facets; and *psoriasis* punctata, guttata, circinata, whose elements are of a more lively red color and eminently scaly. But we must point out that there are real difficulties to contend with when we have to deal with acute outbreaks of lichen ruber planus complicated or not with urticaria. We may then hesitate between the various forms of generalized erythrodermias. At times, the diagnosis is only possible when the swelling of the integuments has diminished and the elementary lesions have again taken on their distinctive features.

B. Lichen ruber obtusus resembles much more the papular syphilide than does true lichen ruber planus. The absence of the peripheral desquamating epidermic collarette and the presence of itching permit of its differentiation.

Xanthoma is distinguished by its localizations, which are so characteristic, and by its yellow color; however, it is well known that in certain cases the xanthomatous elements offer a rosy tint.

C. Lichen ruber acuminatus neuroticus of Unna seems to me to present quite marked difficulties of diagnosis. Several times I thought that I had observed this dermatosis, but there always remained a doubt in my mind. However, its acuminate papules, dry, of a bright-red color, extraordinarily pruriginous, and which may by confluence constitute extensive red areas, its relatively rapid evolution, the general phenomena which accompany it, all of these symptoms seem

to impress upon the affection a quite characteristic aspect. It resembles especially certain forms of *papular eczema*, and I am convinced that cases characterized by similar symptoms to those just detailed have for a long time been described under the name of papular eczema, while others have been very probably called acute lichen simplex (E. Vidal)—the writer's prurigo simplex. Furthermore, as has been already said, there is no bond of union between lichen ruber acuminatus neuroticus of Unna and lichen ruber acuminatus of Hebra-Kaposi (the writer's pityriasis rubra pilaris).

Should true *lichen ruber acuminatus* of Neumann and Neisser be distinguished from lichen ruber acuminatus neuroticus of Unna?

This question seems most difficult to answer. However, according to certain of Neisser's descriptions, I believe that some at least of the cases which he has described as being lichen ruber acuminatus, distinct from the pityriasis rubra pilaris of Devergie, Besnier, and Richaud, are similar to the cases published by Unna. On the other hand it seems to me that certain other cases, those of Neumann in particular, would in France be placed in the category with pityriasis rubra pilaris of which probably they constitute varieties.

D. The aspect of corneous *lichen ruber* (hyperkeratosic lichen) is so typical that it is scarcely possible to hesitate about the diagnosis when one has seen a few cases. Psoriasis, even when irritated, lichenified, and rendered papillomatous, as it sometimes is upon the lower extremities, never reaches the degree of thickening and induration that the hyperkeratosic lichen does.

The *sclerous papillomatous lichen* differs from it in appearance, color, hypertrophy of the papillæ of the derma, and in the crusts and scales which cover it, which in no wise resemble the grayish, adherent, horny desquamation so characteristic of lichen. It differs too by its sensitiveness, which is so special, by the absence of pruritus, and by the small abscesses and ulcerations which complicate it. *Circumscribed scleroderma* may simulate it for the moment, but it is quickly distinguished on close examination by its lardaceous consistence, its even, smooth, ivory-like surface, and the peripheral lilac border.

The *tertiary papillomatous syphilides* present also at times analogous appearances, but usually their limits are more precise, they are more sharply circinate, their evolution is more rapid, they are not pruriginous, and finally in case of doubt antisyphilitic treatment will decide the question.

E. It is especially with *circumscribed scleroderma*, or, to speak more accurately, with certain varieties of *circumscribed cutaneous atrophy* which have been described in recent times, that one might confound lichen ruber atrophicus. The diagnosis will be made upon attentive

examination of the lesions, by their arrangement in lenticular islands, by the existence of punctiform depressions, and at times by the presence in one place or another of papules characteristic of lichen ruber planus.

Etiology—Pathogenesis.

Lassar has described in the lymphatic spaces and the connective tissue of the papules of lichen ruber, slender, short bacilli forming zoöglœa masses; unfortunately subsequent researches have not confirmed this discovery and the hypothesis of the microbic nature of lichen ruber seems to be at the present time almost universally abandoned. The great majority of dermatologists agree, on the contrary, in regarding it as an affection of nervous origin, and the works of Colcott Fox, of Köbner, of Jacquet, and others seem to establish this opinion upon serious arguments. Lichen ruber appears indeed almost always in arthritic subjects (E. Vidal, Lavergne) and those distinctly neuropathic, after sorrows or violent nervous emotions. At times the eruption is accompanied by various nervous phenomena, such as insomnia, agitation, headaches, etc. They are calmed on the contrary and tend to disappear as soon as the nervous excitability of the patient gives way to appropriate measures, and especially as soon as the pruritus is less intense. It is thus that hot sedative douches, as Jacquet has well demonstrated, constitute one of the most efficacious forms of treatment for lichen ruber planus: the itching is allayed, the patient ceases his scratching, and the eruption tends to disappear.

Is it any reason on this account to claim that the eruption of lichen ruber planus is always a consequence of scratching, and consequently wholly assimilable with the dermatoneuroses as regards pathogeny? We do not think so. In the first place the papules are so well defined, and have such a pathognomonic aspect, that we cannot consider them as the products of incessant traumatisms. Besides, it is possible that subjects predisposed to lichen ruber have an itching of the skin and scratch at times without seeing this eruption develop. We have already made known the history of a patient attacked with intolerable itching and an eruption of generalized lichen ruber planus, who was cured of his lichen ruber under the influence of appropriate medication, but who soon had a return of all his former itching. Here scratching resulted in a lichenification of the skin, but the typical eruption of lichen ruber planus did not return. This case proves then that to have an eruption of lichen ruber planus it does not alone suffice to possess a predisposition to this dermatosis and then to scratch; something else is required.

It would thus seem that in lichen ruber planus there are two ele-

ments: 1. A neurotic element which is rarely wanting and which is one of the causes of the terrible itching which patients experience; 2. The lichen ruber planus itself, an affection which develops especially upon a soil eminently neurotic and which, thanks to the preceding element, may become complicated with lichenifications which at times transform the aspect of the primitive eruption. Still, there are cases, few in number it is true, but real cases in which the eruption of lichen ruber planus is not accompanied by any itching.

It is a disease of adult age and is relatively rare in infancy and in advanced life. It appears to be appreciably more frequent in men than in women.

Treatment.

Internal Treatment.

The German school, represented especially by F. Hebra and Kaposi, has strongly insisted upon the great efficacy of arsenical medication in lichen ruber. In the case of infants, Kaposi gives Fowler's solution, beginning with two drops daily and gradually raising the dose. In that of adults he prescribes subcutaneous injections of Fowler's solution, or Asiatic pills,* beginning with three pills per diem and increasing by one pill every four or five days until eight or ten per day are taken. This dose is continued with until the eruption has completely disappeared, and then is decreased to six pills, at which it is maintained for three or four months after the date of apparent cure.

It must be remembered that during the first period of arsenical treatment new crops in abundance are produced, while the long-existing efflorescences only show a very mild degree of regression. As one proceeds with the treatment the exacerbations become more and more rare and insignificant and the old lesions fade away gradually. It requires usually several months to obtain these results. When very large doses of arsenic are taken from the start we can cause a rapid disappearance of the eruption in from two to four weeks, but it is almost always at the expense of the general health. It is the same thing with subcutaneous injections of Fowler's solution or of the arseniate of soda. I am in the habit of prescribing for my patients a solution containing 20 cgm. of arseniate of soda in 50 gm. of cherry-laurel water and 450 gm. of distilled water; each teaspoonful of this solution represents 2 mgm. of arseniate of soda. I give of this in the beginning three teaspoonfuls per day, one at each meal. This is increased by a teaspoonful daily until the patient takes fifteen or

* Composed of arsenious acid, gr. $\frac{1}{6}$, black pepper and licorice, each gr. i.

twenty a day according to his degree of tolerance. This medication will be well borne by albuminurics and dyspeptics if they are at the same time put upon a strict milk diet.

The alimentary régime seems indeed to have a decided importance in the treatment of lichen ruber, at least in France. In cases of moderate intensity we are content to forbid the use of coffee by our patients, also tea, liqueurs, spirits, undiluted wines, strong beers, potted meats, sausages, canned fish, gamy dishes, shell fish, salted fish, and fermented cheese; but when it is a question of eruptions of particular intensity complicated with urticaria and attacks of pruritus giving rise to veritable nervous crises, and when especially there is albumin in the urine, I do not hesitate to insist upon an exclusive milk diet and thus obtain relatively rapid results. Furthermore, in nearly all subjects affected with lichen ruber planus we must pay attention to the state of the nervous system, and Jacquet has shown that in many cases we can modify rebellious eruptions of lichen ruber planus in neuropathics by hydrotherapy and the use of hot sedative douches alone, without any other treatment external or internal. For this purpose he employs tepid douches at a temperature of 35° C., the current of water being projected by means of a watering-pot with a wide mouth, so as to wet the whole body at once. It is not necessary that there should be energetic percussion, and consequently the water should not be under high pressure. The duration of the douche varies from two to five minutes, but it must not be too much prolonged for fear of causing a sensation of fatigue which will react badly upon the nervous system. The rules which we have laid down should not be absolutely enforced, and when the procedure is adopted it must be modified to suit each particular case. According to the individual susceptibility, the temperature of the water varies between 34° and 38° C. and at times it is found well to end with a cold jet of very brief duration. The douche is given with the interrupted jet or with the watering pot nozzle and its duration should vary according to the nervous resistance of the patient. It is necessary that a soothing impression be made upon the subject and one that succeeds in calming the nervous system; for this reason the douche has been called sedative. This measure is of incomparable power in many cases of pruriginous dermatoses developed in neuropathic subjects, and personally I have obtained the most unlooked-for results in cases of this sort. I recommend it most particularly in lichen ruber planus whenever it is possible to resort to it, especially when patients bear arsenic badly or when they are the victims of rebellious attacks of pruritus.

What we have just said proves that while arsenic is a remedy of the first order in lichen ruber planus it is in no wise indispensable,

and even before the discovery of Jacquet it had been proposed to replace it by other substances. Liveing had obtained success with bichloride of mercury, Jonathan Hutchinson and Allan Jamieson with the tartrate of antimony and potash, Tilbury Fox with diuretics, mineral acids, and nux vomica; antipyrin had been given by Blaschko for the pruritus with unhoped-for results, but the action of this remedy is peculiarly variable in different persons. We have verified the fact that, when it is well borne, if it be given an hour before the expected exacerbation of itching, it may suppress it. In particularly rebellious cases, complicated with urticaria and intolerable itching, when we cannot have recourse to hydrotherapy we may employ ordinary remedies against itching, such as carbolic acid, belladonna, hydrocyanic acid, gelsemine, cannabine, solanine, pilocarpine, etc.

External Treatment.

A. Lichen Ruber Planus.—We believe that in many cases of slight or moderate intensity local treatment will alone suffice to cause the eruption to disappear; but we have, on the other hand, the conviction that it is better to employ simultaneously both internal and external remedies whenever it can be done, for thus we obtain much more rapid results. The external applications which have seemed to us to possess the greatest efficacy against lichen ruber planus are the mercurial preparations. We know of nothing more energetic than the Vigo plaster with mercury or Unna's mercurial plaster: these are applied in imbricated bands upon the parts most affected, and they are changed each twenty-four hours, the skin being cleansed with vaseline or with sublimate soap. In eight to fifteen days we almost always cause by this means a disappearance of the eruption. The inconveniences of the medication are: 1. The impossibility of causing it to be well borne by those of irritable skin: 2. The impossibility of covering over large surfaces with the mercurial plaster without giving rise to more or less severe poisoning; therefore these plasters should be applied to the most affected parts only. Again, if the skin becomes inflamed in consequence of their application they are to be replaced by calomel plasters or by Vidal's red plaster, consisting of minium (red oxide of lead), 2.50 gm.; cinnabar, 1.50 gm.; diachylon, 26 gm. —a preparation which is much less irritating than the Vigo plaster.

In cases in which the plaster cannot be used inunctions are to be made with calomel ointment 1 : 20 or 1 : 10, or else with the yellow oxide of mercury 1 : 30 to 1 : 20. Besides this lotions can be used morning and night of a solution of sublimate, 1 : 500 or 1 : 1,000, applied as hot as possible. The pruritus is also to be treated. When the itching is very intense I am in the habit of prescribing

calomel ointment or the yellow oxide of mercury only during the daytime, while during the night I order applied a phenic-acid pomade, either pure or mentholated, or else a preparation to which I have given the name of pomade of three acids, of which the following is the formula: Phenic acid, 1 gm.; salicylic acid, 2 gm.; tartaric acid, 3 gm.; glycerole of starch made with Price's pure neutral glycerin, 60 gm.

E. Vidal believed that tartaric-acid glycerole was a real specific for lichen ruber planus. He usually prescribed as the only medication for this affection inunctions morning and night with his tartaric glycerole (tartaric acid, 1 gm.; glycerole of starch with Price's pure neutral glycerin, 20 gm.). If the mercurial preparations are not well supported, either because they irritate the skin or because they induce toxic symptoms, we may have recourse to salicylic or pyrogallic acid plasters, or else to phenic acid, salicylico-tartaric acid, tar, naphthol, or pyrogallic ointments.

Unna proposed to make a simultaneous application of corrosive sublimate and phenic acid (sublimate, 1 gm.; phenic acid, 20 gm.; excipient, 500 gm.). When there are but few papules he treats them with strong preparations of chrysarobin, sublimated collodion, biniodide collodion, salicylic collodion, traumaticin, or by appropriate plasters, such as those of arsenic or mercury for example. Lassar and Van Dort have gone so far as to recommend that the summit of each papule be lightly touched with the fine point of an electrocautery; after this it is sufficient to powder with some inert substance.

When we have to do with cases of lichen ruber planus having an acute course, extending rapidly, and accompanied by an active inflammatory reaction the preceding topical remedies may not be well borne. Calming remedies are here to be employed until the acute period has passed. We may use emollient lotions, such as a decoction of camomile flowers, bran water, baths of starch and gelatin, oxide-of-zinc ointment, fresh lard, etc.; then as soon as it is possible, we have recourse to active medication, such as has been mentioned above.

B., C. Lichen Ruber Obtusus, Acuminatus.—It is especially in these forms that Unna recommends his mixture of phenic acid and sublimate.

D. Lichen Ruber Planus Corneus.—Lichen ruber planus corneus is very difficult to modify. We must first uncover the affected parts by vigorous soapings, for which purpose we use the soft potash soap, pumice-stone soap, or tar soap; we may also employ black soap plasters, either pure or combined with salicylic acid. At times

it is useful to soften the corneous layers with cataplasms, then to scrape with a curette. When the plaques are freed the Vigo plaster may be applied, or plasters containing salicylic, pyrogallic, or chrysophanic acid, or ointments with resorcin, ichthyol, pyrogallic acid, or chrysarobin. Sailler has obtained good results with applications of tincture of iodine.

E. Lichen Ruber Atrophicus.—We can only advise in these cases, from a local point of view, mercurial preparations, and plasters or ointments appropriate to the susceptibility of the integuments (see above).

Mineral Waters.—After what we have said from the point of view of internal medication it is readily understood that the best springs for the treatment of lichen ruber are those containing arsenic, of which the prototype is the Bourboule in France. Nevertheless neuropathic subjects will derive benefit from the waters of Schlangenbad, Néris, Bains, Luxeuil, Plombières, Wilbad, and especially from a sojourn in the open air at a high altitude in the calm of mountainous regions.

II. THE PRURIGOS.

History.

The term *prurigo* has not passed through so many vicissitudes as the term lichen. It has, however, served to designate several affections, to which at the present time dermatologists will apply only the term *pruritus.* It is thus that Willan, Bateman, and Rayer distinguished three main varieties of prurigo: *prurigo mitis, prurigo formicans*, and *prurigo senilis*, and their descriptions were reproduced with some variations by most of the French and English dermatologists up to the time of F. Hebra. To this observer is due the incontestable merit of placing in relief, in the confused group of dermatoses included in the former term prurigo, a well-defined morbid entity which had been already recognized by Cazenave and Chausit, who made of it an idiopathic neurosis of the skin. This is the *prurigo* of the Vienna school, a disease for which the Germans claim the denomination pure and simple of *prurigo*, without any qualifiying term, but which E. Besnier holds should be called *prurigo of Hebra*, remarking, with reason, that it is quite difficult to cease employing the term prurigo for certain other dermatoses, as for example the prurigo of pediculosis. Whatever may come of these discussions, without great interest for us at the present time, most dermatologists are in accord as to the designation under the term *prurigo* (*prurigo of Hebra* of E. Besnier, *lichen polymorphe ferox* of E. Vidal, *scrofulide bouton-*

neuse bénigne of Bazin, etc.) of a well-defined dermatosis, beginning usually in earliest infancy with an urticaria and by special papular elevations, attaining its greatest development upon the lower extremities, and as regards its extension decidedly rebellious, pruriginous, and showing a tendency to become complicated with eczematizations, lichenifications, and ganglional tumefactions.

Although F. Hebra gave the first masterly description of the affection, its conception is found in the works of the older authors under the names of *prurigo mitis* and *formicans*. Cazenave in particular, whose works upon the pruriginous affections of the skin are most remarkable, recognized clearly this dermatosis, and he traced the important lines of it with perfect accuracy. But it is to the head of the Vienna school that we must accord the credit of having brought it out and established it clearly as a distinct morbid entity. All countries subjected to the direct influence of the old Vienna school, such as Germany, Austria, Denmark, England, America, Italy, Russia, etc., have accepted without the least discussion the beautiful conception of its master. In all these countries there is only one dermatosis worthy of the name prurigo, and it is the one which F. Hebra described. In France this form encountered very serious resistance. Certain dermatologists, such as Hardy, Hillairet and Gaucher, refuse to consider the disease which we are discussing as a well-defined morbid entity. Others, like E. Vidal, remark that Hebra was not the first to describe this affection, and from a symptomatic point of view it would be better to give to it the name of lichen polymorphus ferox. Others finally, as E. Besnier and Doyon, while really adopting the ideas of F. Hebra, believe that it would be difficult in France to prevent physicians from speaking of "*prurigo pédiculaire*," of "*prurigo sénile*," etc. They have thought it useful to add to the word prurigo a term which would remove every vestige of ambiguity, so they have gaven to it the name of *prurigo de Hebra*. At the present time, since the death of E. Vidal, this doctrine is almost universally adopted by the French physicians, so that we may consider the reform of Hebra definite. However, it has undergone in France certain slight modifications of which we may say a few words.

In recent times certain anomalous or atypical forms of eruption closely allied to prurigo have been studied with care in our country from a clinical standpoint, and it is to the new French school that we are indebted for our knowledge of *prurigo ferox* (E. Vidal, Brocq), of *prurigo simplex* (E. Vidal, Brocq, Tommasoli), of the *diathetic prurigos* (E. Besnier), dermatoses which are allied to typical prurigo yet worthy of a description by themselves.

A. Prurigo of Hebra.

Symptoms.

The typical prurigo of F. Hebra is an affection which is eminently rebellious, of an extraordinary tenacity, capable in severe cases (prurigo agria or ferox) of persisting during the whole lifetime. It usually begins in early infancy, occasionally (especially in France) in childhood, and even in youth. Then it persists with recurrences constituting sorts of successive outbreaks more or less acute and separated by intervals of absolute or relative calm.

In severe cases in the eighth or tenth month of life eruptive elements are seen to appear which resemble urticaria, or, to speak more properly, lesions characteristic of urticaria almost always precede and accompany the typical eruptions of prurigo. Thus the patient may have at first only whitish or rosy plaques of urticaria with itching, agitation, and insomnia; and then appear the well-defined papular elements of a pale red color, the size of a medium or large pin's head, making a perceptible prominence both to sight and to the touch, nearly always excoriated at the summit, very pruriginous, becoming more prominent by rubbing, and indeed somewhat urticaria-like. They are situated especially upon the anterior and external portions of the legs and thighs, about the pelvis and the buttocks, upon the external and at times the anterior portions of the upper extremities. In this stage, the cutaneous lesions are wholly constituted by these papular elements which are rarely intact, but more often excoriated at the summit and covered with a small blackish crust, so as to give the typical aspect to the lesion called by the older authors the *papule of prurigo;* after becoming excoriated these papules may become slightly inflamed and present a somewhat infiltrated base of a vivid red color, but more frequently they become effaced, and disappear in a measure, leaving only the small crusts due to scratching. Here and there and periodically there may also be observed the real elements of urticaria. But, as the disease passes through its evolution, it loses little by little its primitive features. The incessant traumatism produced by the infants who suffer terribly with itching modifies the aspect of the affected regions. The papules are produced in greater abundance, and press one against another. The skin thickens, hardens, becomes the seat of an infiltration which becomes more and more profound and extensive, is furrowed with folds disposed in a quadrilateral manner, and covered over with small crusts and scales; in a word the lesions of lichenification (see the preceding article on Lichen) which are slowly produced.

Besides this one often sees small vesicles spring up, which, though minute, give rise to a serous exudation of yellow color, stiffening the underclothing, and hardening into yellowish crusts, often sanguineous and blackened by reason of scratching; these are the lesions of eczematization, which come from time to time, complicating the morbid scene, appearing more or less frequently, and lasting a longer or shorter time according to the case.

It is not rare to observe also lesions of inoculation consecutive to scratching, such as impetigo, ecthyma, furuncles, at times even lymphangitis, abscesses, etc. (pyodermitis).

Lymphatic glandular enlargements, in particular those in the fold of the groin, are swollen, almost always indolent, and may go so far as to constitute true tumors. In a word, the disease once developed presents itself under an aspect eminently polymorphous, varying in different cases and at different periods of the same case.

At the time of an acute exacerbation, we see produced over a greater or smaller extent of the surface, according to the intensity of the case, more or less extensive plaques, with irregular notched borders and with ill-defined limits, of a brownish-red color, at whose site the derma is infiltrated, thickened, seamed, excoriated, often oozing, covered with crusts of yellowish or brownish color, and upon which a few scattered large, curly, black hairs stand out, constituting a sort of hypertrichosis without lanugo. All around these plaques, which correspond to the older types of lichenoid eczema, or lichen agrius, isolated papules are seen here and there disseminated, excoriated at their summit. These complex lesions, still further complicated at times, as we have just said, by pyodermitis, are observed upon the face, forehead, and cheeks, where they are relatively frequent, but they are most numerous upon the extremities, and particularly upon the extensor surfaces of the lower extremities, and the dorsal surfaces of the feet; they are more rarely found upon the trunk where ordinarily we meet with isolated papules only (Hebra). They take on the activity which we have just described periodically; it is especially in winter or in the spring that these acute exacerbations are manifest, and during these exacerbations very itchy new papules develop with rapidity, at the same time that the older plaques swell up, become red, and show some exudation. Then, after a certain lapse of time, these inflammatory phenomena decline, the pruritus ceases or diminishes considerably, the isolated papules disappear, the plaques dry up and are no longer complicated with eczematization; they now present a grayish-red tint, at times somewhat pigmented, and are covered over with epidermic scales of greater or less thickness which are removed by the scratching. The skin at

their site always remains thickened and infiltrated; it is roughened, even lichenified, but little or not at all eczematous. Upon the limbs it is often so thickened that one can scarcely pinch it up. According to Kaposi, in passing the hand down over the surface of the body one feels that in approaching the lower portions of the leg the lesions become progressively accentuated. In this consists one of the chief features of his prurigo.

He distinguishes two varieties: one the *prurigo agria* or *ferox* (Hebra) of which we have already given a description and in which the skin lesions are most extensive, scarcely leaving intact any part except the large articular folds; the other *prurigo mitis, partial prurigo,* in which the morbid phenomena are much less intense, the papules less numerous, the infiltrations less profound and less extensive, the pruritus less intense, and in which the lower extremities alone may be affected to the exclusion of other regions of the body. These two forms ordinarily remain distinct—that is to say, one who has been subject from his infancy to prurigo mitis will not see develop in his person with advancing years a prurigo agria, or vice versa.

Course, Duration, Prognosis.

We have little to add to what goes before. According to the Vienna school the prognosis of prurigo is very unfavorable; the disease is incurable and persists during life. The great care which is given these patients is, however, not useless, for by it the skin may be brought into a condition which is relatively tolerable, while on the contrary if they are neglected the skin thickens more and more, becomes pigmented, immobile upon the subjacent tissues, and finally, when touched imparts a sensation of roughness similar to that of a file, and when rubbed gives out a sound similar to that made by a short-bristled nail brush or sandpaper (Hebra). The complications of pyodermitis, of abscess, and of lymphangitis are produced, eczematization invades the whole integument, even the flexor folds and the entire face and the scalp where it compromises the hair growth.

According to the French school, on the contrary, prurigo is only rarely incurable; we believe that with improved hygiene, and with persistent local and general therapeutic measures, we may succeed in benefiting many patients and even in curing them. The differences of opinion perhaps depend upon differences of race and surroundings.

A disease so terrible exercises, it is almost unnecessary to say, a considerable and disastrous influence upon the physical and moral life of its victims. Their general health is affected by the incessant suffering to which they are subjected. As the affection evolutes by

successive outbreaks they have from time to time periods of calm during which they regain hope of being able to live as others do, but soon, after some imprudence or without apparent cause, there comes on a new crisis; and then, covered with eczematoid lesions, papules of prurigo, etc., attacked with a pruritus which forces them beyond all power of control to scratch with madness, passing sleepless nights, they are obliged to give up all ordinary work, all social relations, and marriage even becomes for them almost an impossibility.

Happily all cases of prurigo are far from having such consequences; and in prurigo mitis, in the cases especially which we see in France, and which, with good care, disappear between the eighth and eighteenth year, the prognosis is much less gloomy.

On the other hand we have often observed in subjects affected with these relatively benign forms of the affection a marked tendency to attacks of asthma, emphysema, and chronic bronchitis. There exists a sort of alternation between the pulmonary and cutaneous symptoms. Every time an infant affected with prurigo of Hebra is taken with an intense bronchitis or pulmonary congestion, the eruption becomes pale, and may even disappear almost completely in twenty-four to forty-eight hours in severe cases; it is then strongly indicated to make repeated use of revulsives.

Pathological Anatomy.

The constitution of the initial papule of prurigo has been much discussed. According to Auspitz and Caspary it is due to a proliferation of the rete without inflammatory participation of the papillary network; according to Riehl the morbid process is analogous to that of urticaria, and this author describes inflammatory lesions in the papillary layer; according to Simon, Hebra, Derby, and Kaposi the papule is uniquely constituted by a cellular proliferation in the papillary body, with serous exudation more or less abundant. It is analogous to that of papular eczema.

Leloir and Tavernier,* on the contrary, establish clearly the proper individuality of the initial papule of prurigo (1889).

"It is neither a vesicle of papulo-vesicular or other eczema, nor a phlyctæna, nor a nodule of epithelial proliferation of the Malpighian body, nor an exudation product coming from the papillary layer, nor a papule of lichen, nor a pomphus of urticaria, nor an element of parasitic prurigo. It is a sort of cystic cavity developing in the interior of the Malpighian body, increasing in volume, always having for its roof the Malpighian body or the horny layer in its full integrity, and for its inferior and lateral walls the Malpighian body tend-

ing to keratinization upon the surface in the lesions which are oldest. Add to this that this cyst, as it were, encloses a clear fluid, some altered epithelial cells, and a few scattered white blood corpuscles. Let us note in closing that there seems to exist at times a sort of relationship between the formation of this cyst and the excretory duct of the sudoriparous glands." According to Darier,' the lesions of the papules of prurigo of Hebra are identical with those of prurigo simplex (see below) and consist: "1. In an acute inflammatory œdema of the papillary body and of the epidermis, corresponding to the erythematous or urticarial areola and to the central papule; 2. At the summit of the papule is found a lenticular plaque formed of epithelial cells in colloid degeneration, plaques which one sees with the naked eye, under the form of a yellowish stain; 3. Beneath exists a zone of vascularization which is well marked, but more or less extensive according to the case. The relation of the small vesicle of prurigo to a sudoriparous canal, which Leloir and Tavernier have pointed out, seems to me to be accidental, when it exists."

The ulterior lesions of prurigo present nothing special. They are those of chronic eczema, or, better, of lichenification; "thickening and proliferation in the layers of the mucous network, deposits of pigment disseminated in the chorion, abundant penetration of cells in the latter, especially surrounding the vessels; here and there dilatation of the lymphatic vessels and of some sudoriparous glands in consequence of the proliferation of their cellular covering. Finally we recognize in certain places the malformation of the follicles by vegetations, which are produced upon the sheaths of the hair roots, the hypertrophy of the arrector muscles of the hairs and in the older forms the atrophic degeneration of the follicles and of the sebaceous glands" (Kaposi).

Etiology—Pathogenesis.

Hebra's prurigo begins most frequently in very early life, about the second or third year. This is, according to Hebra and Kaposi, an essential condition without which we cannot consider a cutaneous affection, presenting the symptoms which we have just been studying, as being a true prurigo. My own observation and that of our French teachers justify me in the assertion that this opinion is far too exclusive; dermatoses which appear to us in all ways worthy of the name prurigo may begin in later childhood, in adolescence, and even in adult life.

Both sexes are liable to the disease; perhaps men are most frequently affected.

Hebra and Kaposi think that the affection is aggravated during

the winter. According to Ehlers the summer is by far the worse season for it. We believe that Besnier and Doyon are in the right when they say that, according to the case, the winter, the springtime, or the summer aggravates the lesions; at times the exacerbations are independent of the influence of the season or of the temperature.

Hebra and Kaposi admit that prurigo is an affection of the poorer classes, of feeble infants, those badly nourished and scrofulous, with prominent abdomen. They think that in some cases there is a certain hereditary disposition, so much the more as we not infrequently see several infants of the same family affected. They have also remarked that in the mother pulmonary tuberculosis or a strongly marked anæmia is quite often present.

There is much truth in these propositions. However, I believe, with Ehlers, that the proportion of infants affected with prurigo is quite as great in the better class, even the rich, as among the poor. I do not believe, as does Augagneur, that clogging of the system can be regarded as a sufficient cause for provoking this affection. I agree with Comby and other authors, that faulty alimentation, badly regulated in infancy, may contribute to its development, but I believe further that by itself alone this cause cannot produce the disease.

The inevitable origin of prurigo is to be found in the constitution itself of the patient. As I wrote long ago, prurigo appears to be the result of a mixture of arthritism, of lymphatism, and of neurotism. The majority of subjects affected seem to have in their early days quite a severe dose of lymphatism. They are very impressionable. Their nervous system is one of great excitability. They agree with the type denominated by Bazin *scrofule irritable*. They are the issue of neuropathic parents, anæmic, debilitated, vitiated in their constitution by dwelling in large cities, by alcoholism, by excesses of all kinds, by syphilis, tuberculosis, or gout. Then the occasional causes intervene which provoke the appearance of prurigo upon this soil so admirably well prepared, or, to speak more accurately, these individuals react toward prurigo the moment they are subjected to these occasional causes, such as faulty alimentation, dentition, psychic impressions, variations in temperature, etc., however slight these may be.

If one understand well this pathogeny, it is seen at once that we consider the prurigo of Hebra as a neurodermatosis (see our researches of 1892 upon the pruriginous affections of the skin) and that we accept the ideas of Cazenave, who regarded this affection as a disturbance of the nervous system, as a sort of hyperæsthesia of the skin. We do not agree with Hebra and Kaposi that the sensation of itching is determined by the papule and by the irritation which the small amount of serum, which comes suddenly into each efflorescence,

exerts upon the nerves of the papillæ. We believe that here, as in many other pruriginous dermatoses, the pruritus is primary and the cutaneous eruption secondary to the various traumatisms of which the integuments are the seat. Here as in urticaria (Jacquet) it suffices to apply absolutely hermetic dressings in order to prevent the eruptions from being produced. Unfortunately, from a practical point of view, as we shall see further on, this radical medication is scarcely possible; and, furthermore, in the majority of subjects it sets up such nervous excitement, by placing them in a position in which it is impossible to relieve the pruritus by scratching, that it becomes useless and dangerous. Still these results prove in the most irrefutable manner the capital importance in this affection of the modification undergone by the nervous system. This neuropathic origin of prurigo will also explain its symmetrical development, its relations with urticaria, its localization at the points subjected to the maximum of pressure and rubbing, such as upon the extensor surfaces of the limbs, etc. Let us add that there are almost always in this affection disturbances of the cutaneous secretions, and in particular a very marked dryness of the affected regions.

Diagnosis.

The prurigo of Hebra has a general physiognomy which is very characteristic when it is at its period of full development. It is true that it may be mistaken for *a simple lichenified eczema* when we observe it during an acute exacerbation, but its localizations, its duration, its history, its glandular hypertrophies permit of its being recognized in this case. We do not speak here either of the itch or of phthiriasis with which an attentive examination will not permit of its being confounded. *Pruritus hiemalis*, which offers indeed certain traits of resemblance to it, is distinguished by the lesser intensity of its lesions and by the fact that the attacks occur in the cold season. *Pruritus senilis* is not accompanied by the lichenifications, or by an eczematoid eruption; *chronic urticaria* is distinguished from it by the same characters.

Still it is very difficult, if not to say impossible, to diagnosticate a prurigo at its onset, when all that we observe as symptoms are those of urticaria and a few papules of prurigo, either excoriated or not. The problem is, so to speak, insoluble, and we often ask ourselves whether we have before us a persistent urticaria, a simple prurigo, or a true prurigo just beginning. It is necessary to wait in order to know with which of these three dermatoses we have to do. We must further recollect that there are between them many stages of transition.

Treatment.

Internal Treatment.—We believe with the majority of the older French writers that internal medication has an importance of the first order in prurigo.

It is at first altogether indispensable that the alimentation be regulated and supervised. In infants of early age milk of excellent quality, either pure or diluted with a little alkaline water, given in proper quantities, constitutes the food of first choice. In adolescence and adult life we must forbid coffee, tea, liquors, undiluted wine, etc. (see article Lichen Ruber).

The medication which has seemed to us the most useful is a good quality of cod-liver oil. It can be administered pure, according to the age, in doses of from one to six tablespoonfuls per day. We may also with advantage give either phosphorized, carbolized, or iodized cod-liver oil. We prescribe it when it is possible during the whole winter, and in large doses, but in those compatible with a healthy action of the digestive apparatus.

After cod-liver oil it is, in spite of what Kaposi says, arsenic which has rendered us the greatest service, especially as administered in a long stay at the springs of Bourboule, where, as is well known, one drinks and bathes in the waters. For patients who cannot go to this thermal station we prescribe during the whole summer the arseniate of soda in progressively increasing doses, going from 6 mgm. to 2 or 3 cgm. daily. We frequently associate it with pilocarpine as in ichthyosis, in doses ranging from 2 to 8 or 10 mgm. per diem. Certain authors administer these two remedies by subcutaneous injection.

For the itching there has been recommended, and justly, carbolic acid in pills of 5 to 10 cgm., given in such a way that from 20 to 80 cgm. and even more are taken daily; at times quinine and ergotin are of some utility. Occasionally the tincture of gelsemium, or that of cannabis indica, or the alkaloids of these plants, gelsemine, cannabine, bring about a certain relief.

When the excitability of the nervous system is marked, the indication is to calm it by hydrotherapy with heat (see article Lichen Ruber Planus), by the administration of preparations of valerian, distilled cherry-laurel water, musk, castoreum, asafœtida, or even antipyrin, bromides, or chloral.

When it is the lymphatism which dominates, besides the remedies already mentioned we may employ antiscorbutic syrup, the iodized syrup of horseradish, iodo-tannic syrup, syrup of the iodide of iron, the hypophosphites, bitter tonics, such as gentian, hops, erythræa, etc.

When it is the arthritic element which predominates, especially when the subject is emphysematous, we may attempt to give iodides, and in this case we should first try the iodide of sodium in small dose, by itself or combined with cod-liver oil; if this drug is badly borne, it should not be persisted in, but if it be tolerated then we can pass on to the iodide of potassium. It is well to aid all the excretions, to give milk and mild diuretics, and to administer laxatives from time to time, even though they may not seem necessary.

The number of *mineral waters* which have been recommended in these rebellious dermatoses is large. Bourboule has always seemed to me to benefit those patients who have gone there; I believe that this water acts at the same time as a specific remedy and as a tonic. True scrofulous subjects do well on the medium or stronger sulphurous waters of Suchon, of Cauterets, of Barèges, and even at times on the chloride of sodium waters, such as the saline springs in the Jura, Salies de Béarn, Briscous at Biarritz, Bex en Valois, and especially Kreuznach in Germany. The scrofulous tainted with arthritism are benefited at St. Gervais, Uriage, St. Honoré les Bains. A long course of the baths of Louèche have been successful in rebellious cases.

External Treatment.—When the integument is irritated, inflamed, eczematous, we must at first calm it by bran baths, starch baths, frictions with decoction of elderflower, chamomile, or marshmallow (often, however, these lesions do not bear well the contact of water), by applications of potato-flour or starch poultices, by wrapping up with cheesecloth doubled eight or ten times and wet with the foregoing decoctions in full strength or diluted with boric-acid solution, and then covering with some impermeable tissue, such as mackintosh, oiled paper, sheets of gutta percha, gold beaters' skin, etc. When the irritation is calmed, or in the periods of repose of the affection, we must resort to more energetic topical remedies.

By far the best local remedy is cod-liver oil; we recommend it the more since one can if necessary employ it at all periods of the disease, and even when acute exacerbations are present. It is well to employ the absolutely pure oil called *virgin*. When itching is too intense we may add either naphthol (1 : 30 to 1 : 10), or phenic acid (1 : 100 to 1 : 50). We may be satisfied to apply the cod-liver oil upon the diseased surfaces, but in this case we must make continued applications, for the skin dries with the utmost rapidity. It is better to soak cheesecloth folded eight or ten times in it and wrap up the affected parts, covering it over with the impermeable dressing. For the face I use a cheesecloth mask with holes cut for the eyes, the nose, and the mouth.

A mixture of equal parts of cod-liver oil and fresh styrax ointment has often rendered signal service in my hands.

Cod-liver oil plasters constitute an excellent topical application which I cannot too strongly recommend. They are applied in bands, one superimposed upon another, so as to overlap and cover in all the diseased points. These are changed every twelve to twenty-four hours according to the case. When the pruritus is very intense I add to the oil β-naphthol, or phenic acid. Aside from their excellent local action these plasters have the advantage of preventing the patient from scratching. *The treatment of prurigo of Hebra by cod-liver oil internally and externally constitutes, in my opinion, the fundamental medication of this disease; it should be prescribed from the first.*

Another preparation which has at times given good results is the ointment which I usually employ for pruriginous affections of the skin, which is thus formulated: Phenic acid, 50 cgm. (from 30 cgm. to 1 gm.); menthol, 40 cgm. (from 25 to 70 cgm.); salicylic acid, 60 cgm.; oxide of zinc, 8 cgm.; lanolin, 16 gm.; vaseline, 26 gm. Patients anoint themselves morning and night.

At times fresh lard is better tolerated by the irritated skin: it is employed alone or with the addition of a little tartaric acid, salicylic acid, or phenic acid; wrapping up the parts in liniment of olive oil and lime water, alone or with phenic acid added, also calms the itching in a few cases.

Kaposi recommends that each night a light friction be made with an ointment composed of naphthol 5 parts, emollient ointment 100 parts, upon the skin of the extremities, principally over their external aspect, over this a powder being applied. In children below the age of ten years he orders an ointment of one-per-cent. to two-per-cent. strength of the same. Besides this we may give a bath every second night, using naphthol and sulphur soap.

Tar forms an excellent topical application in certain cases; it is employed in the form of tar baths, with the use of tar soap of which the foam is allowed to dry upon the skin, and more frequently in the form of tar ointment in strength varying from 1 to 5 parts in 20 parts of the excipient. We have in these cases seen real benefit from an excipient composed of 5 gm. of fresh styrax ointment in 15 gm. of vaseline. These ointments are especially indicated in cases where the skin is not too much inflamed. Oil of cade occasionally replaces the tar with advantage.

In rebellious cases I have used sulphur, either in the form of baths with sulphur soap or in the form of ointments. I have seen the older physicians of the St. Louis Hospital, and among others Hillairet, prescribe successive applications such as are employed for scabies. Applications of Vleminckx's solution or of Wilkinson's ointment as modified by Hebra, or sulphur baths, to which are added

500 gm. of gelatin, have benefited certain cases. Furthermore, nearly all the remedies useful in rebellious eczemata may render service here: ointments of salicylic, boric, tartaric, or phenic acid, of resorcin, ichthyol, pyrogallic acid, etc., salt baths, or alum, soda, sublimate, iodine, bromine, or oak-bark baths, etc.

But of all the modes of employing remedies, we repeat in closing that it is the hermetic envelope, preventing scratching, which acts with the greatest rapidity, caoutchouc moist dressings covered with impermeable tissue, various plasters, pure cod-liver oil naphtholated or phenicated, oxide of zinc pure or phenicated, combined with tar, oil of cade, resorcin, ichthyol, simple plaster, Vidal's white plaster, and for infants Beslier's varnish.

B. Diathetic Prurigos of E. Besnier.

On the 12th of May, 1892, in a communication to the French Society of Dermatology and Syphilography, Dr. E. Besnier[1] created the name *prurigos diathésiques* for a whole series of cases analogous to the prurigo of Hebra, which, however, do not enter into the altogether too narrow class as established by the Vienna master. They are characterized by the major fact that they are "*multiform, pruriginous, chronic, and paroxysmal dermatoses.*"

"Their chief symptom and their first symptom is pruritus, a pruritus which is intense, remittent, with nocturnal paroxysms, with remissions and exacerbations corresponding to the seasons. Quite frequently it appears in infancy or in youth, but also in other periods of life, often in an insidious manner and nearly always masked. An absolutely fundamental character is that none of the lesions which accompany it or which it provokes is specific. In early age it may be any one of the numerous varieties of infantile erythemata, urticarias, and pseudo-lichens. . . . Later on when the disease is established, we still see at times certain of these forms reappear, but it is especially the lichenification of the papules either in plaques or in large areas, and at the moment of the paroxysms the eczematization under the various forms of eczema, figured, diffuse, impetiginous, etc. . . .

"When the disease begins in early infancy it may preserve its features, remain ill defined, be abortive, or, after some years of existence, have a more or less prolonged intermission, or remain absent entirely. In many cases the process leaves the skin momentarily or definitely to assume visceral localizations, of which emphysema, asthma, bronchitis, hay fever, and more rarely gastro-intestinal disturbances will later on constitute the predominant manifestation.

"When once established the disease becomes a morbid possession of the individual, a diathesis of pruritus. It may become attenuated or disappear, but is rebellious to all treatment; if it gets well or runs its course, we cannot say that with certainty we have cured it. It is a veritable pruriginous diathesis with multiform lesions, no one of which can serve by itself alone as a denomination for the disease. It is a prurigo in the true sense of the word, a diathetic prurigo."

The interest attached to this communication of E. Besnier is that it shows most clearly that there exists a series of cases analogous in their clinical physiognomy to Hebra's prurigo, but which cannot enter into the category fixed with such narrow limits by the Vienna school. They differ from typical prurigo in beginning during adolescence or adult life, in the face being the first and the most markedly affected, the localization of the eruptions differing from that indicated as pathognomonic by Hebra, in the seeming absence of the typical papules of the prurigo of Hebra, in that the affection having begun with pruritus only shows itself exteriorly by pure lichenification, eczematization, etc.

In a word there exists a whole series of cases of variable gravity forming an uninterrupted chain from typical prurigo to the most benign pruriginous dermatoses, characterized objectively by eczematization and lichenification. All these questions must be taken up and studied from new standpoints.

C. Prurigo Ferox of E. Vidal.

Quite apart from the typical prurigo of F. Hebra there is a special morbid form which most authors confound with this same prurigo. I have given it, with E. Vidal, the name of *prurigo ferox* and would denominate it *prurigo ferox of E. Vidal* to distinguish it from the grave varieties of Hebra's typical prurigo, which most dermatologists call also prurigo ferox (see above).

It is characterized from an objective point of view by quite voluminous papules, of a size which varies from that of the head of a large pin to that of a very large pea and even greater; they are of a pale-red, at times of a bright-red color; almost always when seen they have become excoriated and are covered with a brownish crust more or less thick; more rarely they are intact, and then they sometimes present at their summit a sort of opaline elevation of the epidermis, or a sort of vesicle quite well formed, or in some rare cases, and the most severe ones, a true pustule which rests upon an indurated bright-red base. These elements are disseminated here and there without any definite order over the whole body and even over

the face and scalp. But it is in the region of the back, shoulders, the extensor surfaces of the limbs, and the wrists that they are the most numerous. They appear in successive crops, each day bringing new ones without our being able to say in advance where they will occur; and on the other hand there are the successive phases of aggravation, during which the affection becomes intolerable, and of calm, when the patient may believe he is on the highroad to cure. Nevertheless it is rare that during these periods of calm there is a complete cessation of the morbid symptoms.

The itching in this form of prurigo reaches such a degree of intensity that it is not rare to see its subjects arrive at a state of true nervous exhaustion. Insomnia may be complete for many days. As soon as he is disrobed the patient is wholly engaged in scratching or, more accurately, in tearing his skin and causing it to bleed. The skin may thicken somewhat and harden under the influence of scratching, and may even become pigmented, but large plaques of lichenification and of eczematization are never seen as in the typical prurigo of Hebra. Indeed, as to evolution, duration, and especially as to incurability, it is a true prurigo. It differs from the type of the Vienna school by the large size of the papules, by the special intensity of the pruritus, and by a much less marked tendency to the production of lichenifications and eczematizations. The lymphatic glands are often swollen. We have observed Vidal's prurigo ferox in men who had been affected from infancy, and in neuropathic women suffering with serious uterine disease, such as fibroma.

Vidal's prurigo ferox has seemed to me to be still more rebellious than the common variety of prurigo. In certain cases wrapping up in cod-liver oil plasters or covering with a varnish has seemed to procure alleviation, but this improvement is always momentary and of short duration. In other cases the envelopment treatment is not at all tolerated; I have succeeded in obtaining toleration only for a thick ointment containing menthol or phenic acid. No internal medication has given me satisfactory results. At times antipyrin (when it is tolerated), gelsemium, cannabis indica, belladonna, and pilocarpine have produced the illusion of a momentary half-success.

D. Prurigo Simplex.

Prurigo simplex has been observed by all the older dermatologists. Their *lichen simplex sparsus* in adults, their *strophulus simplex intertinctus* in infants, belong to this morbid type. In recent times it has been classed under urticaria. It is to E. Vidal[1] that the honor belongs of having recognized it as a distinct morbid entity under

the name of *acute lichen simplex*, and it was myself [11] who first defined the limits and traced the differential diagnosis. Later I again took up the study in the two successive editions of my book upon the treatment of skin diseases (1890-1892) [12] and gave a definite description in a journal article. [13]

Tommasoli [14] deserves the credit of recognizing the great affinities of this affection with Hebra's prurigo and of marking its place in nosography alongside of this dermatosis. He wished to give it the name *prurigo temporaire autotoxique* to show on the one hand its benignity and fugacity, and on the other hand its origin. But in this consists the whole part that in true justice can be attributed to him in the study of this disease, of which he has to the present day neither given a complete description nor related a truly typical observation, at least according to my views. I have since had the good fortune to see my conception of this affection, as well as the name which I have given to it, adopted by the great majority of French dermatologists.

Symptoms.

The mode of onset of the affection is ordinarily quite sudden. At time its appearance is announced by certain general symptoms, but very slight ones, by a minimum of febrile reaction, by anorexia, and by malaise. Usually, however, there is no disturbance of general health. The patients are taken with the eruption without any apparent cause, or at least without premonitory or concomitant phenomena sufficient to attract their attention. In some cases the onset seems to be accompanied by urticaria, or at least the characteristic papules seem to be produced upon urticarial elements. A number of these subjects, not to say all of them, are threatened with urticaria, that is to say, the slightest traumatism upon their integument suffices to determine the development of urticarial elements. The eruption invades from the first the upper extremities, and in particular the external surface of the forearm and the elbows; at times, on the contrary, it begins about the neck or the lower extremities; or, again, it seems to occur simultaneously upon the various sites of election.

Prurigo simplex is solely constituted from an objective point of view by one eruptive element, which undergoes very few modifications of any importance in its appearance and typical evolutions. It is a slight congestive prominence, papular, at first rosy, and capable of becoming a red of more or less bright hue, distinctly elevated above the surrounding skin, and giving to the touch the sensation of a solid elevation. The limits are quite well defined, a little diffuse, however, like that of all the erythematous elements, especially

when it has an urticarial base. The dimensions vary from those of a medium-sized to those of a very large pin's head; its form is almost always that of a truncated cone rounded on the summit; at times it is as though flattened, rarely altogether acuminate. At first its color disappears by finger pressure, later on there persists a rather brownish tint; in some cases a slight extravasation of blood forms in the centre.

While the papule is very young it is almost always possible, in observing it with much attention, to see at its summit a whitish or opaline tint which at times takes on a somewhat yellowish tone; upon piercing the epidermis at the summit we may obtain a very minute quantity of a transparent liquid. All the young elements do not present this feature, while, on the contrary, there are those which contain a more considerable quantity of fluid, and which seem to be true papulo-vesicles; this liquid may even become decidedly cloudy during the progress of the evolution of the elements, and we find ourselves face to face with papulo-pustules, but this is extremely rare.

The papule then soon becomes covered over in its centre by a sort of small adherent crust whose dimensions are those of a medium-sized pin's head and whose color is from a brownish-yellow to a dark brown. At first upon seeing the crusts which crown the papules one thinks them the result of excoriations due to scratching. They depend, however, almost always upon the natural evolution of the papule and are the consequence of desiccation of the pseudo-vesicle at the summit. But it is undeniable that certain elements are excoriated, and that they present in this case a blackish blood crust upon the eruptive element, such as is considered typical of parasitic prurigo. It is in this case that they may leave behind rounded, whitish cicatrices of a lustrous aspect which persist for a very long time; otherwise the crust ends by becoming detached of itself after a certain time when the papule is resorbed, and it leaves usually beneath it a light-brownish pigmentation which finally disappears by degrees; but this may also be wholly lacking. In a word, prurigo simplex heals in the great majority of cases without leaving the least trace of its existence. At times a fine desquamation is observed all around the central crust. There are elements in a certain sense aborted without central vesicle or crust which disappear by resorption in three or four days. The ordinary elements require an average of six or eight days to pass through their stages. The regions which are most affected by the eruption are the external surfaces of the limbs, and especially the external surfaces of the forearms, the elbows around the olecranon, the knees about the knee cap, the dorsal surface of the hands and fingers; then come the neck, the buttocks, the

anterior and posterior regions of the trunk, and the dorsal surface of the feet; the flexor surfaces are little or not at all affected, and the same is the case with the large articular folds; the face is but rarely implicated in the acute forms. However, even in these cases we have observed eruptive elements upon the forehead, upon the ears, and to a slight extent upon the cheeks. One of the principal characters of the disease is the dissemination of the lesions. Almost always the eruptive elements are isolated from each other, conforming to the type *sparsus*. It is more infrequent to see them spring up one alongside of another in sufficient abundance to form groups which are always minute and ill defined. But even then each papule is distinct, recognizable, and quite individualized; it touches the neighboring papules only by its red base, it never forms with it by confluence veritable plaques of infiltration over which the elements would be confused in one inflammatory cake. Indeed, there is produced in this morbid type neither eczematization nor true lichenification of the skin.

The affection evolutes by the successive production of new papules. At times the first outbreak is the most important, and this is followed by crops, a new one coming before the old has disappeared, but less and less severe until new elements are no longer formed. At times, on the contrary, the first outbreaks are quite circumscribed, not violent, the eruption gradually becomes generalized, and is prolonged by the continuous production of new papules; after a time the crops become less intense and finally cease altogether.

In a word, the total duration of the affection may vary within quite wide limits according to the case. In the instances which we are considering as typical examples of the acute form of the disease (prurigo simplex acutus) its course is from about two weeks to two months. Recurrences, however, are possible, and seem even to be relatively frequent, reproducing the disease in a rather regular manner at certain seasons. This leads us quite naturally to speak of the subacute and chronic forms of prurigo simplex. In carefully studying the cases characterized from an objective point of view by the symptoms which we have just described, we find a whole series with tendency more and more to become chronic, or, to speak more accurately, protracted, made up of successive crops more or less subintrant which cause the disease to be prolonged for months and even for years. Ordinarily, however, a certain period of calm is produced in these latter cases during the winter, much more rarely during the summer. We have studied these under the name of prurigo simplex subacutus, of prurigo simplex chronicus recidivus, etc. (see the memoir above mentioned for further details).

Subjective Phenomena.

The patient experiences all the sensations of pruritus, tingling, pricking, shooting, and sticking pains, at times of burning, which are more or less acute according to the case, but which are almost always intense. It is probable that they precede the eruption. They are rarely continuous, but present periods of complete calm or relief for several hours followed by exacerbations, which come on especially at evening and during the night; at times they cause insomnia and are absolutely intolerable.

Pathological Anatomy.

The papule of prurigo simplex is, according to Darier, absolutely identical as to its anatomical constitution with the papule of Hebra's prurigo (see above).

Etiology—Pathogenesis.

Prurigo simplex is a very common eruption in early infancy; it is relatively quite frequent in childhood, during adolescence, and from the fifteenth to the thirtieth year. The two sexes seem to be equally predisposed. It develops especially in the spring, in summer, and in the early autumn, but is rare in winter; cases come in series, as though they had been subjected to a certain epidemic influence depending on the season or other cause. Quite often patients attribute their eruption to abundant perspiration or to errors of diet. We have frequently noted a neurotic tendency in the patients or in their antecedents. As to the primary cause of these eruptions, or their true nature, we can as yet only formulate hypotheses.

Diagnosis.

Prurigo simplex differs from *urticaria*, an affection with which it has, however, the closest connection, by the distinctness, the circumscribed character, and the smallness of its papulo-vesicle, by its quasi-cyclic evolution. It is distinguished from the *papular erythemata* by the same features, and by the subjective derangements which accompany it; from *miliary sudamina* by its localizations, by the volume and small number of its eruptive elements; from true papular eczema by its never presenting true eczematous lesions, by its elements being always disseminate, distinct the one from the other and never exuding any serum of yellow color which stiffens linen, etc. Analogous reasons permit us to separate clearly the *diathetic prurigos of eczemato-lichenoid form*, and the typical forms of Hebra's prurigo. Still

there exists a real affinity between our prurigo simplex and Hebra's prurigo, and this affinity is established by the eruptive element which is analogous to the papule at the onset of prurigo. To Tommasoli belongs the great honor of having brought out these common features.

Treatment.

We shall be brief upon this point. In the way of internal medication there is scarcely more to be done than to cause the patient to follow out the same alimentary hygiene as would an eczematous subject; if we have to deal with chronic cases we should institute sedative treatment of the nervous system by hot-water applications or by appropriate medicines (see Lichen Ruber). As external measures in acute cases, simple care as to cleanliness, antipruriginous lotions (see Lichen, Prurigo), an ointment of thick zinc oxide (lanolin and vaseline) to which is added phenic acid or menthol, dusting with starch powder, and the wearing of loose garments of fine and old linen, will almost always bring about rapid cure. In rebellious cases we must have recourse to the same topical remedies as in Hebra's prurigo.

III. PITYRIASIS RUBRA PILARIS.

According to Besnier[14] *pityriasis rubra pilaris* is a dermatosis "whose essential element is an accidental anomaly of keratinization of the epidermis—of which the primordial objective phenomenon is a hyperkeratosis exfoliating in small shreds, having as its centre of origin, its fundamental seat, the wall of the follicular infundibulum, the adjacent sebaceous glands, and the bed of the nail, that is to say, the points where the physiological evolution of the epidermis is particularly active."

History.

This affection, whose study is of quite recent date, has given rise for the past ten years to interminable theoretical discussions which are not yet at an end.

The first really authentic observation published was by an English physician, C. Tarral, who had a case at the St. Bartholomew's Hospital in London in 1828, and communicated an account of it to Rayer.[15] But neither Tarral nor Rayer understood the importance of *this case*. It was Devergie[16] who first, in 1857, having observed two other analogous cases, grouped them to make a new morbid type under the name *pityriasis pilaris*. But his conception of the new dermatosis was quite erroneous, for he did not attribute all the symptoms

observed in the patients to one and the same affection. He believed that the follicular elevations alone constituted the pityriasis pilaris, and that this pityriasis was associated in them with other concomitant affections, such as pityriasis capitis, psoriasis or pityriasis palmaris et plantaris, and pityriasis rubra. In 1865 Hillier ("Handbook of Skin Diseases," p. 60) published a beautiful example. Tilbury Fox (*Medical Times and Gazette*, May 10th, 1873, p. 487 *et seq.*, and "Skin Diseases," 3d ed., p. 254) connects pityriasis pilaris with pityriasis rubra, and believes it is but a simple complication. He, however, studies a most convincing case of it. It was the same with J. Hutchinson,[17] who described several examples of it under the name of lichen psoriasis.

During this time there were collected at the St. Louis Hospital of Paris records which permitted Richaud, one of the best pupils of E. Besnier, to give the first precise, complete, and true description of this affection. According to this author all the various morbid manifestations already seen by Devergie, the pityriasis capitis, the palmar and plantar psoriasis, the pityriasis rubra, the circumpilar papules, are not lesions of different nature passing through their evolution simultaneously in the same subject, but are only manifestations of aspect a little different of one and the same affection to which he gives the name pityriasis pilaris (Thèse de Paris, 1877).

In 1882 and in 1884 I demonstrated with the most convincing evidence that the pityriasis pilaris of Devergie-Besnier-Richaud should be completely separated from pityriasis rubra, and that this affection has especial affinities with psoriasis.[18] Furthermore, studying the question of its connections with lichen ruber acuminatus, a question now brought up for the first time, I concluded that most, if not all, of the cases described under the name of lichen ruber acuminatus by the Vienna school were nothing more nor less than cases of pityriasis pilaris.

In 1886 I again took up this point and in 1889 [19] I presented another memoir *à propos* of Taylor's article.[20] At about this time, too, the French views concerning pityriasis pilaris had penetrated into foreign lands. C. Boeck [21] published an excellent work upon the question.

The masterly memoir of Besnier finally came to settle in a definite manner the existence of the affection. Since then little has been added to the clinical and anatomico-pathological history of the affection, although numerous cases have been reported from different countries. Nevertheless this particular point of dermatology is one of those which furnish much for discussion, for since 1889 most authors who have occupied themselves with it, forgetting somewhat by the way our own researches, strive to give the exact relations which

exist between lichen ruber acuminatus and pityriasis rubra pilaris (see upon this point the numerous communications of Kaposi to the various congresses and German societies, his last work which appeared in the *Archiv für Dermatologie und Syphilis*, Bd. XXXI., Heft I., p. 1; his discussions with Neumann, Hans Hebra, Lang, the very interesting researches of Neisser, etc., etc.).

In a word it seems proven at the present time, upon the acknowledgment of most dermatologists of the Vienna school, that a number of cases formerly described under the term lichen ruber acuminatus are cases of pityriasis rubra pilaris; on the other hand it is probable that there are rare cases with special evolution, and having an objective aspect worthy the name of lichen ruber acuminatus, which are in no sense instances of pityriasis rubra pilaris (see for further details the chapter on Lichen Ruber).

Symptoms.

The *mode of onset* of pityriasis rubra pilaris is most variable; it may be said that it is multiform like the dermatosis itself. Ordinarily it develops slowly, insidiously so to speak, by a circumscribed cutaneous lesion, which is unaccompanied by any functional disturbance. More rarely patients experience a slight degree of general malaise, and complain of tingling or pruritus at the seat of the beginning eruption; in some cases, still more rare, but of which we have seen examples, this dermatosis has an abrupt onset, foudroyant as it were, in the form of an erythrodermia which is generalized or nearly so, simulating a scarlatiniform erythema with predominence in certain regions of the body, especially upon the hands and feet; the general condition can in this case be quite seriously affected, and we have observed fever and marked malaise in the early days, but soon the acute inflammatory symptoms begin to disappear little by little, and the true torpid character of the eruption appears.

In the great majority of cases pityriasis rubra pilaris is gradual in its onset. It may appear first as characteristic circumscribed papules disseminated here and there over the trunk or upon the upper limbs, particularly upon the postero-external surfaces of the forearms, and upon the dorsal surfaces of the phalanges. At times also the first appreciable symptom is a diffuse redness of the palms of the hands or of the soles of the feet, with dryness and the production of a certain degree of keratodermia. We should be suspicious of any diffuse erythematous keratodermias of the palms and soles which develop without appreciable cause, and the same is true of the persistent and exaggerated desquamations of the bed of the nail, the

abnormal production of greasy scales upon the scalp, abundant pityriasic desquamation of the eyebrows, of the mustache, of the chin, especially when they are accompanied by a certain redness with tension and stiffness of the skin of the face.

Pathognomonic Features.

The most important symptom of pityriasis rubra pilaris, that which carries the diagnosis with it, is a variety of circumpilar papule of a more or less bright red color, nearly always slightly brownish, but at times also appearing as grayish-white, of almost earthy hue, at times blackish, and again of a pale or brownish red; its form is usually acuminate, conical, more rarely round, and umbilicated. Its projection above the surface of the skin is likewise most variable. Upon the external surface of the forearm it is almost always from 1 to 2 mm. high, and then gives a sensation to the touch similar to that of a file. Its volume varies in the same degree, nearly imperceptible in many cases upon the dorsal surface of the phalanges, where it only figures as a kind of small black or brownish point about the opening of the hair follicle, while upon the limbs it may reach the dimensions of the head of a large pin or even greater. The dryness is absolute, and there is never any exudation. It presents in its centre a more or less thickened scale of variable size, grayish, whitish, or even blackish, which corresponds to the orifice of a pilosebaceous follicle, around which the lesion develops: at times it is a flattened scale bearing in its centre a blackish point; at times it is a scaly cup-shaped mass developed around a hair; again a true epidermic cone, thick and deep, penetrating into the interior of the follicle, and leaving after its ablation a sort of central cavity. The hair around which the lesion is developed is in typical papules ensheathed in horny and sebaceous layers, starting from the point where the duct of the annexed sebaceous gland opens into the follicle. Very often starting from this point it is curled up or broken, and rarely has its normal appearance. The papules which we have just described (and of which the chief characteristic is, as we have seen, the absolute dryness and their constant development about a pilosebaceous follicle) are isolated at first, scattered here and there over one or more regions of the body, in particular upon the external surface of the forearms. Little by little their number increases, others are produced in the neighborhood of the first, and frequently they come to touch each other.

From now on the aspect of the affection is completely modified. The papular elevations seem to become effaced and, as it were, to

disappear, and there forms in their place a sort of even mass of a more or less brownish-red color upon which one sees scaly points corresponding to the follicles and presenting upon their deep surfaces horny epidermic cones surrounding the hairs of which we have just spoken. These spots or red plaques, which are consecutive to the confluence of the erythematous rings developed about the primitive epidermic cones surrounding the hairs, form at times, by the gradual confluence of the neighboring papules, vast uniform psoriasiform areas of scaly aspect (pityriasis rubra of Devergie) which may become covered with pearly scales of relatively large size, at times adherent and becoming more pearly from scratching, especially over the elbows and knees. The derma may even become gradually infiltrated and thickened, its folds exaggerated, and the redness of the integuments, instead of completely disappearing under pressure as it does in the beginning, may be seen under the glass plate which fills the office of compressor, to assume a yellowish tinge. Furthermore, in these cases the color of the infiltrated areas may vary from a rosy or red hue to a brownish-red or chamois-skin color. Upon the neck and the extensor surfaces of the large articulations, the dermic papillæ may appear hypertrophic; they are ensheathed with epidermis more or less dry and plaster-like, forming a series of lines corresponding to the folds of the skin and simulating ichthyosis hystrix.

It is usual to find all round these plaques isolated circumpilar papules in all degrees of development, pale or rosy red, slightly elevated, or decidedly acuminate. However, in some old cases this pathognomonic element may be wanting and the clinician should be forewarned.

The usual localizations of these lesions are the dorsal surface of the phalanges, where they generally form a small black area about the hair, the postero-external surface of the forearm and of the arm, the antero-external surface of the thigh, the legs, the olecranon region, the infrapatellar region, the neck, the back, the hips, the buttocks, and the dorsal surface of the hands. All the lesions are ordinarily absolutely symmetrical.

Special Lesions of the Various Regions.

Face.—When the face is invaded—and this is the rule—in pityriasis rubra pilaris, it may take on very diverse appearances. Nearly always the integuments are reddened; they present a tint bordering more or less on the bistre, and which is only incompletely effaced by finger pressure; they also become infiltrated, moderately thickened, and quickly undergo a process of retraction pronounced enough to occasion a more or less marked degree of ectropion. The patients

experience further a most marked sensation of tension of the skin of the face. In some cases the skin presents only a fine furfuraceous desquamation upon an erythematous base. At times there are, strictly speaking, only pityriasic scales, either generalized or localized at certain points, as upon the brows, the mustache, the chin; finally at times the face, which is entirely red, is covered over with a sort of plaster-like coating, which is abundant and pityriasis-like in the region of the cheek bones, thick and disposed in rough more or less lineal masses about the nose, forehead, and lateral regions of the cheeks.

Scalp.—Upon the scalp there exists almost always a pityriasis-like desquamation, more or less abundant, more or less fatty (pityriasis capitis of Devergie), without any cones surrounding the hairs, and most often even without appreciable redness of the subjacent derma. In some cases, rare however, the seborrhœal productions take place upon the scalp with such intensity that adherent accumulations of sebaceous matter are found which are most difficult to remove, and beneath which the scalp is much congested. Ordinarily the hairs are spared. However, in some regions, such as the axillæ and the pubes, the hairs may fall out.

Hands and Feet.—We will not further insist upon the special aspect of the dorsal surface of the phalanges, but would speak of the lesions which are observed so frequently upon the palms of the hands and the soles of the feet. They have very variable aspects, at times those of more or less marked keratodermic thickening, usually not very pronounced; more often they are reddened plaques of variable dimension, slightly pruriginous or indolent, dry, and over which the flexion folds are very well marked, as though exaggerated, and the thickened epidermis is in a state of slight desquamation; it is furthermore relatively frequent to see the palms of the hands and the soles of the feet affected in their whole extent.

Nails.—The nails are nearly always altered in pityriasis rubra pilaris, but they are affected in very diverse ways and in various degrees. At times they scarcely present any modifications in their color and consistence, appearing more transparent and as though softer; at times they are marked with transverse furrows of varying depth and width; at others they present longitudinal elevations and depressions; and again they are thickened in their lower half or lower third, simulating the appearance called pithy. Finally at times these lesions are somewhat painful, or, more properly speaking, the sensitiveness of the ungual region is exaggerated, and in some cases the patient experiences spontaneous pains here which are quite severe.

Subjective Phenomena.

Subjective phenomena are but slightly marked in pityriasis rubra pilaris, nevertheless it is frequently remarked that patients have slight or even at times quite intense pruritus, formication, sensations of burning, and feelings of marked tension of the skin.

General Condition.

The general condition seems to be always good, and aside from some cases of very sudden onset in which there was slight fever, malaise, chilliness, digestive troubles, and anorexia, I have never observed that this disease affected in any way whatever the general health of the patient.

COURSE, DURATION, TERMINATION.

There is nothing more variable than the course of pityriasis rubra pilaris; nothing more different than the appearance of two patients affected with this disease, and often there is a marked difference between the appearance of the same patient in the different phases of his dermatosis. At times we encounter intense cases in which the whole body is invaded. The integuments may now be covered over with an extensive red uniform mass in a state of furfuraceous desquamation here and there, while in other places it is lamellated with exaggeration of the cutaneous folds which take on diamond shapes or the form of squares, bands, etc., or they are covered with little dry papules more or less numerous, more or less miliary, more or less acuminate. At times there are abortive cases, in which we find only plaques upon the palms and soles, desquamation upon the scalp or brows, pale redness of the face with tension of the cheeks, or else some papules about the hairs upon the dorsal surfaces of the phalanges, upon the external surface of the limbs, about the knees or elbows, isolated or grouped in the neighborhood of the psoriatiform plaques.

All of these dissimilar appearances may be observed in the same subject in the different phases of the affection. The dermatosis may even, at the end of some months or some years, consist in quite extensive plaques of a uniform redness, with sharply defined borders, at times raised up by dermic infiltration of the parts affected, at times without elevation, and without peripheric papules around the hairs. Furthermore, the course of pityriasis rubra pilaris is only very rarely regular; it may develop in a symmetrical and gradual manner and thus invade extensive surfaces or even the entire surface of the body, and then retrocede little by little; it may also, and this

is the rule, only pass through its evolutions in crops, undergoing quite rapid and inexplicable exacerbations, interrupted by periods of calm or of retrogression which are quite as extraordinary.

We have already said that the disease presents no real gravity so far as life is concerned, but as regards its duration and termination the prognosis is most grave. This affection is eminently torpid in its period of full development, it persists for months almost without modification, and when remissions occur their duration cannot be foretold. The complete disappearance of the eruption is possible, but nearly always a recurrence takes place after a variable lapse of time; occasionally these relapses are very close to one another, while, again, on the contrary, they may appear only at intervals of several years. We may then say without being taxed with exaggeration that the duration of pityriasis rubra pilaris is indefinite, and that one cannot conscientiously promise a complete and lasting cure.

It seems to be proven that this affection may terminate in the *herpetide exfoliative* of Bazin.

Pathological Anatomy.

According to the researches of Jacquet "the cone surrounding the hair in pityriasis rubra pilaris is simply due to an exaggerated keratinization of the epithelial wall of the infundibulum." According to this author there is no occasion to suppose a special alteration followed by the shedding of the internal or external sheath of the hair root. Jacquet has always observed in his microscopical examinations the integrity of the internal sheath; as to the external it undergoes some alterations in its epithelium, simply in its suprasebaceous part. The sudoriparous apparatus does not wholly escape. Jacquet found irregular corneous masses about the excretory orifice at several points testifying to an exaggerated epidermic evolution. "In sections taken from fully developed lesions the greatest development of the epidermic layers is seen about the pilo-sebaceous follicles. The mucous body is thickened, the interpapillary prolongations are hypertrophied, misshapen, and limiting the enlarged and deformed papillæ. The stratum granulosum is in places somewhat thickened, but on the whole about normal. The stratum corneum is considerably thickened and divided into regular stratified lamellæ without nucleus." Finally the papillæ of the upper layer of the derma are more or less infiltrated with migratory cells.

From this it results that the initial lesion of pityriasis ruber pilaris seems indeed to be a modification of the epidermis. This affection is consequently essentially a hyperkeratosis, or more properly a dyskeratosis, having for its principal point of departure the seba-

ceo-pilar and sudoriparous infundibula. The lesions of the chorion seem to be always secondary.

Etiology.

Pityriasis rubra pilaris may begin in any age, but it usually makes its first appearance during infancy or youth (E. Besnier). It seems to be more frequent in men than in women. All possible pathogenic conditions, and in particular an emotional or nervous state, have been noted in the various reports of cases, but we must admit that the true pathogeny of this affection completely escapes us.

Diagnosis.

In his masterly memoir, to which we again refer the reader for fuller details, Besnier expresses the belief that we can differentiate anatomically pityriasis rubra pilaris from the majority of similar diseases, since "the essential element of the affection is an exfoliating hyperkeratosis having at its centre of origin, its fundamental seat, the wall of the follicular infundibulum, the adjacent sebaceous glands, and the bed of the nail. . . . The nutritional deviation seems to start from the Malpighian network in the wall of the neck or of the infundibulum of the follicles, from the epithelial layer of the bed of the nail which represents it and which separates the nail from the derma beneath the nail, or from the layer of steatogenic sebaceous cells; and then it becomes generalized over the whole network, producing the alterations of keratinization, hyperkeratoses, hypersteatoses, and keratolyses, as well as epithelio-sebaceous desquamation. When the swelling of the network and the hyperkeratosis have acquired a certain degree of development, hyperæmic troubles appear in the papillary network of the derma—œdema of the papillæ, exudation in the superficial layers of the corium—but there is never any dermatitis nor folliculitis properly speaking. . . . These features differentiate it at once from the affections which correspond to the various types of dermatitis of exfoliating nature designated by the words pityriasis rubra, and from acute generalized primary or exfoliating dermatitis. For the same reasons all those affections are differentiated from pityriasis rubra pilaris which truly deserve the name of lichen and in which the disturbance of the corneous or epidermic function is materially allied to irritation and to neoplastic infiltration of the papillary, the subpapillary, and the periglandular derma (lichen scrofulosorum, Wilson's lichen, lichen ruber acuminatus, etc.).

"The question is no longer so simple when we have to differentiate in a purely anatomical sense pityriasis rubra pilaris from the other epidermidoses, such as psoriasis and ichthyosis. . . . As

for psoriasis, without taking account of the somewhat questionable difference which, according to Suchard, depends upon the absence of the granular layer and the correlative nucleation of the horny layer, which belong especially to psoriasis, we may retain the localization in the follicular system which is so precise and so typical of hyperkeratosis and which does not belong to psoriasis" (E. Besnier, *loc. cit.*, pp. 107–108). Ichthyosis is differentiated, from an anatomical point of view, by a lesser degree of activity in the morbid process and by its quasi-congenital origin.

But if the pathological anatomy permits us to establish the morbid individuality of pityriasis rubra pilaris, the clinical side furnishes elements of diagnosis still more precious, although each of the objective symptoms which we have passed in review may be observed in other dermatoses; but their *ensemble*, their mode of grouping, their localization, in a word the general aspect of the affection upon which we have so much insisted, constitute a pathognomonic picture. Ichthyosis differs from it by its localizations, since it affects but little or not at all the large articular folds, the face, and the neck, which are on the contrary the most implicated in pityriasis rubra pilaris, by the slight amount of redness which the skin shows, and by its long duration; but it is at times complicated by passing irritations or even by superadded erythrodermias which might render the diagnosis rather difficult; but even here it is possible to make the diagnosis by taking into account the appearance of the face, the lesions of the dorsal surfaces of the phalanges, of the scalp, and of the nails (E. Besnier).

Keratosis pilaris rubra at times simulates pityriasis rubra pilaris to the point of confusion; without great care these two affections may well be confounded, and this is so true that certain authors would make of them one and the same morbid type (see the recent works of Neisser). A little reflection, however, will convince us that fundamental differences separate them. Keratosis pilaris rubra has well-known localizations, the posterior surface of the arm, the postero-external surface of the forearm, the antero-external surface of the thighs, the buttocks, lateral aspects of the cheeks, brows, space between the brows, etc., which are not altogether those of pityriasis pilaris; it has an evolution of extreme slowness and a tendency to definite cicatricial atrophy of the hair follicle; it never gives rise to red and desquamating areas upon the trunk and limbs. I would refer the reader for further details to my previous writings upon this question.[33] I cannot conceive how any one could confound two affections so dissimilar in nature and evolution; although it is true that a pityriasis rubra pilaris may very well develop in a subject affected with keratosis pilaris.

Psoriasis differs from pityriasis rubra pilaris in the absence of cones around the hairs, in its special mode of desquamation, in the almost constant and absolute integrity of the face, in the aspect of the scalp lesions, of the nails, etc.; but it must be remembered that at times the red and scaly plaques of pityriasis rubra pilaris simulate completely the patches of psoriasis, especially when they are located about the knee caps and when there is an absence of peripheral isolated cones surrounding the hairs. In these relatively rare cases a faulty diagnosis is almost always made, unless one has a large experience in the affection which we are now studying. It is truly no longer necessary to point out the differential diagnosis between pityriasis rubra pilaris of Devergie, and true *pityriasis rubra*. Since my researches on this point[1] it has been superabundantly proven that these two affections have between them nothing in common beyond an unfortunate similarity of name. Pityriasis rubra is one of the most grave disorders, characterized by a generalized redness of the skin, with incessant epidermic exfoliation, perhaps having a relationship with a tuberculous infection (Jadassohn), and not presenting any cones around the hairs. As a contribution to the history of these affections, I may mention that previous to the publication of the works above mentioned much confusion existed regarding these two morbid groups, and we find described, under the name of pityriasis rubra, many instances of cutaneous redness in large but circumscribed areas attended with exfoliation, which were only slightly atypical phases of pityriasis rubra pilaris (see above).

In the same way we know now that certain important dermatoses, such as generalized exfoliative dermatitis, the exfoliating herpetides consecutive to eczema and psoriasis, the desquamative scarlatiniform erythemata of prolonged evolution, consecutive to drug intoxication and particularly to mercurial poisoning, etc., may at times become complicated at certain points of the body, and in particular upon the dorsal surface of the phalanges, by the production of epidermic cones analogous to those of pityriasis rubra pilaris.

In such cases we must take into account the whole eruption and the general physiognomy of the disease in order to arrive at the diagnosis.

It is upon the same principle that we must base the differentiation between *lichen ruber* and pityriasis rubra pilaris in the rare but real cases in which the lichen ruber planus is complicated in certain points of the body, as upon the limbs, trunk, or flanks, by an eruption of acuminate lesions appearing to be formed around the hairs. It is always easy, we believe, even in these apparently ambiguous cases, to make a diagnosis by searching out the typical ele-

ments of lichen ruber planus in their seats of election, and by keeping in mind the general physiognomy of the eruption. I do not believe that those cases can be considered as transition forms establishing a close connection between true lichen ruber planus and pityriasis rubra pilaris, for the acuminate lesions seem to be purely accidental additions to the dermatosis, the most striking feature of which is, after all, the presence of the typical elements of lichen ruber planus. I do not believe that herein lies a sufficient argument for claiming the identity of two dermatoses differing so greatly in appearance, evolution, and in therapeutic reaction.

As to true *lichen ruber acuminatus neuroticus* of Unna, it differs from pityriasis rubra pilaris by the very nature of its elementary primary lesion, which is a true papule, by the intensity of the pruritus, the gravity of the general condition, the rapid evolution, and by the good effect of appropriate local treatment.

We should now, to make the subject complete, speak of the differences which enable us to distinguish pityriasis rubra pilaris from *lichen scrofulosorum* and the various processes which have till now been classed under the term *acne cornea*. These are, however, really exceptional cases, as yet but little understood, the study of which is being even now pursued. They have very few features in common with the affection which now occupies us. It seems, therefore, better not to enter into the details, which would require much space to be of any real value.

Treatment.

I know of no internal medicine which is really efficacious in pityriasis rubra pilaris. Phenic acid, cod-liver oil, and arsenic have been tried without effect. I have recommended the arsenite of soda in gradually increasing doses, with careful watching (this drug has been accused of producing exacerbations), and the use of pilocarpine in small dose, but long continued. The patient must indulge in violent bodily exercise and endeavor to induce perspiration. As to local treatment we are justified in pityriasis rubra pilaris—at least, in the torpid forms—in acting energetically, using preparations of the greatest activity. Indeed the topical medication is almost analogous to that for psoriasis. The substance which has seemed to give the least bad results in the majority of cases is pyrogallic acid associated with salicylic acid; for example, pyrogallic acid, 6 gm.; salicylic acid, 2 gm.; pure vaseline, 60 gm. The quantities in this formula are increased or diminished according to the amount of cutaneous irritability. Each evening an energetic friction is made with this ointment over all the affected points, and a flannel garment is worn during

the night. In the morning, if the patient is obliged to attend to his occupations, and if it is not desirable to continue the ointment during the day, a bath is taken with hot water and salicylic-acid soap, tar soap, or ichthyol soap; if, on the contrary, treatment can be kept up during the day, a new inunction is practised. It is well for the patient to take a full alkaline bath from time to time, during which the affected areas should be well lathered with one of the above-mentioned soaps. As in psoriasis it is useful, whenever possible, to anoint with the salve immediately upon leaving the bath.

When we apply a strong preparation of pyrogallic acid to a large surface the urine must be watched to avoid accidents of intoxication, upon which it is not necessary here to insist. The skin should also be carefully inspected, and the treatment must be suspended whenever an inflammatory or painful reaction is noted, however slight it may be. In this case we may resort to emollients, such as glycerole of starch alone or with the addition of salicylic or tartaric acid, fresh lard, vaseline, cod-liver oil, medicated gelatins and pastes, prolonged baths, and even to potato-flour poultices, or cheesecloth bandaging. The latter is done by folding the material eight or ten times and dipping it in chamomile solution, then wringing it out and applying to the skin, covering the whole with adhesive plaster or gutta-percha sheeting. Whenever the sebaceous coatings are very abundant, as for example on the face or scalp, they are to be detached with sprays, soapings, moist dressings, applied in the manner just indicated, or by the application of caoutchouc dressings.

Besides this the other local applications employed in psoriasis may also give good results. I have seen improvement in cases of pityriasis rubra pilaris treated with tar—oil of cade either alone or in association with salicylic acid in the following form: pure oil of cade, 50 gm.; salicylic acid, 3 gm.; black soap, a sufficient quantity to make an emulsion with the oil of cade; and glycerole of starch made with Price's pure neutral glycerin, 50 gm.

Naphthol in ointment of thirty-per-cent. or twenty-per-cent. strength occasionally renders good service for the face. The carbolic preparation, and in particular the ointments made with lanolin and vaseline, holding from one to two per cent. of the phenic acid and salicylic acid, are indicated for the relief of itching when it exists.

The various mercurial preparations seem to be of great efficacy here as well as in psoriasis. I have benefited patients by lotions of Van Swieten's solution and by inunctions with calomel ointment. The yellow oxide ointment combined with the oil of cade (E. Vidal) has seemed to act well in rebellious cases; this is the most usual formula (it may be modified according to the individual susceptibil-

ity): yellow oxide of mercury, 1 gm.; pure oil of cade, 5 gm.; green soap, enough to emulsify the oil; pure vaseline, enough to make 20 gm. of ointment. It is not necessary to add that in the great majority of cases it is inadvisable to employ these mercurial preparations except upon limited surfaces, so as not to expose the patient to mercurial intoxication.

Furthermore, medicated plasters act best when there are only a few lesions. After a series of experiments which we have carried out we believe that they should be given the following order of preference, according to their efficacy: Vigo plaster and the mercurial plaster of Unna (by far the most energetic), red plaster (formula of E. Vidal), plasters with oil of cade, with salicylic acid, or with cod-liver oil. These plasters are ordinarily changed every twenty-four hours; however, if necessary they may be left in place for forty-eight hours; the diseased surfaces are then cleansed with vaseline, lathered well with tar soap, and when not too much inflamed they are covered over again with a new piece of the plaster. If the skin becomes irritated the plasters are omitted for a time and the various emollient applications of which we have already spoken are employed. When, however, the inflammation has subsided the plasters are again applied, and so on until cure has been effected.

IV. LICHEN SCROFULOSORUM.

F. Hebra, and later Kaposi, described under the name of *lichen scrofulosorum* a dermatosis, relatively rare, especially in France, which is characterized from an objective point of view by species of "papules of the size of a millet seed or even of a pin's head, very much flattened, slightly resistant, of a pale red, brown red, or even livid red color, disposed in groups or masses and at certain points in circular lines having the width of a centime piece, or even of a five-franc piece (a silver dollar). These papules have at their summit a little scale, more rarely a very minute pustule, and after a quite long course, they are resorbed under their primitive form." [24]

Symptoms.

In the few very rare cases which it has been our fortune to observe, this affection was clearly constituted by papules surrounding the hairs, of quite variable dimensions and appearances, nearly always disposed in plaques. Those in the centre of the plaques, and consequently the oldest, were pale, flattened, dry, scaly, or shiny, and simulated at times quite prominently the elements of lichen ruber planus; those of the periphery were, on the contrary, more voluminous, of a more active

red, more prominent, and certain ones presented very clearly in the centre a diminutive pustule or a small crust. Nearly always the elements which go to make up the plaque were distinct from one another, although at times very close; however, here and there they seemed to be confluent. The centre of certain plaques seemed to be normal, an appearance probably due to resorption of the elements which had first appeared. These plaques were of the most variable dimensions, from the size of a fifty-centime piece to that of a five-franc piece. They were usually separated by large areas of healthy skin. Their form was rounded, more frequently oval, and quite often irregular by confluence of several neighboring plaques; they thus formed segments of a circle in whose centre pigmented scaly macules were at times found, the vestiges of preceding papules. Between the plaques there were here and there to be seen a few disseminated papules.

The patients experienced sensations of itching, which were, in the majority of instances, not intense; at times, however, the affection is truly pruriginous, but almost always then there are complications of an eczematous nature of which we shall have more to say farther on.

The habitual localizations of these lesions are the trunk, particularly the hips, the flanks, the lower portion of the abdomen, and the upper portion of the thighs; they may also be observed upon the back, shoulders, upper and lower extremities; when they appear in the latter situation they may become surrounded by a livid areola (Kaposi). The course of the disease is exceedingly slow; the plaques spread out little by little, progressing excentrically; and at times, becoming confluent, they cover over quite large areas, in which the skin is grayish, and here and there almost blackish, scaly, dotted here and there with aborted papules, desquamating pigment spots, papules more or less red, and papulo-pustules.

The German authors are agreed in saying that in serious cases we often see an eczematous eruption of the scrotum and pubis, with fetid extravasation or oozing, and the formation of more or less thickened crusts. Upon the pubes there are numerous pustules surrounding the hair. I have myself seen this in one very severe case.

Prognosis.

The prognosis of the cutaneous lesion itself is relatively benign, in spite of its very slow evolution. It has, indeed, a tendency to spontaneous recovery without leaving any trace, excepting where some of the lesions have suppurated and thus occasioned cicatrices.

The individuals who present this eruption are after all what the older physicians called by the name of scrofulous. They have a sallow complexion, puffed-out cheeks, fine and transparent skin, and

thick lips; they have or have had submaxillary, cervical, or axillary adenopathies, voluminous, engorged, at times painful, inflamed, and even suppurating. Cases have been published in which there had been or were present at the time tuberculous ulcerations of the skin in a state of activity, or else bony changes, such as caries or necrosis, with or without consecutive cutaneous lesions. It is an affection of youthful subjects, and is very rarely, one might almost say never, present after the age of twenty-one; boys seem to be more frequently affected with it than girls (Lukasiewicz).

Pathological Anatomy.

According to Kaposi, "the local process of lichen scrofulosorum consists in a cellular infiltration and in an exudation having its seat in the hair follicles and in the adjoining sebaceous glands, in the tissues about, as well as in the papillæ which are in the immediate neighborhood of the follicular orifices. The tumefaction and the infiltration of the papillæ form the papule, and the mass of epidermis, the hyperplasia, or the exudate at the orifice of the follicle represents the central scale or the little pustule." But the recent researches of histologists have raised a most interesting question, that, namely, of the directly tuberculous nature of this lesion. In 1891 Jacobi declared the elements of lichen scrofulosorum had from a histological point of view the structure of true tubercles, and that there were to be found present epithelioid cells, giant cells, and even Koch's bacillus. The same year A. Sack also proved that the papules of a case of this affection had the same structure as tubercles. According to Darier (1893) the papules of lichen scrofulosorum form around a hair which ordinarily appears healthy; "its sheaths are but little altered; but in the perifollicular connective tissue are found masses of tissue of tuberculous appearance composed of epithelioid cells, of numerous giant cells, and of embryonic fusiform cells, the whole being enclosed in a fibrillary stroma."

Nature of the Affection.—In spite of the histological examinations just mentioned, the question of the real nature of lichen scrofulosorum is still discussed. Jacobi is the only author who has found Koch's bacillus in the sections, and up to the present time no positive result of inoculation in animals has been obtained. On the other hand it is known that the giant cells have nothing pathognomonic about them so far as the true tuberculous nature of a lesion is concerned, since they are found in numerous dermatoses having nothing in common with tuberculosis. Furthermore, the characteristic clinical evolution of these forms of folliculitis, their tendency to spontaneous cure, the slight degree of gravity in the cutaneous lesions which they produce,

in contradistinction to all the other tegumentary tuberculoses, are so many arguments which *a priori* prevent our admitting for lichen scrofulosorum the hypothesis of a direct bacillary inoculation. However, one cannot refrain from taking into consideration the preceding histological arguments, as well as those derived from Neumann's cases. This author has seen the elements of lichen scrofulosorum disappear under the action of injections of Koch's tuberculin. Schweninger and Buzzi have seen an eruption of lichen scrofulosorum appear in a tuberculous subject following the same injections; and Hallopeau has argued from this that the toxin of tuberculosis is sufficient to provoke the disease. I am more disposed to accept this hypothesis than that of a direct bacillary inoculation, for it agrees better with the clinical evolution of the dermatosis.

However, we must regard as still undetermined the exact and real nature of lichen scrofulosorum, while recognizing that its relations with tuberculous infection seem to be most close.

Diagnosis.

Lichen scrofulosorum has clinically quite a typical physiognomy; typical enough to be recognized at once as soon as one has seen a case. However, the question arises whether there are not several dermatoses of different nature which may take on this aspect. It will remain for subsequent histological and bacterioscopical investigations and experimental inoculations to answer this question. For the present we can only repeat that, from a clinical point of view, this dermatosis seems to constitute a unique and special morbid type. *Acne cornea* differs from it by its hard cones, which are prominent, disposed in porcupine-quill fashion, with the elevations around the hairs standing out prominently. However, it presents certain features in common with lichen scrofulosorum: its usual disposition in plaques which are rounded or oval, its situation upon the trunk, although with predominence toward the neck and the upper portion of the thorax, its torpidity, and its slowness of evolution.

Recently there have been described under the term *acné kératique* certain dermatoses which are objectively neighbors of the preceding and perhaps in reality related, which also simulate in some features lichen scrofulosorum. These questions demand further study.

Hallopeau has reported a case of lichen scrofulosorum simulating *pityriasis rubra pilaris* and *lichen ruber planus*. These are instances of extreme variety and which are mentioned only as a matter of record, for the distinctive features of these affections are totally different one from another.

A dermatosis which is more readily confounded with lichen scrofu-

losorum is the variety of eczema called *follicular*, which is occasionally observed in infants, and which is characterized by rounded or oval patches disseminated here and there over the trunk and limbs. In these cases, still insufficiently studied and known, our only resource in making a diagnosis is to carry out a histological examination, or to base it upon the more pronounced degree of eczematization of the integument.

The *miliary papular syphilide*, or *syphilitic acne*, or *syphilitic lichen* may also at times contribute to the confusion. We do not speak, be it understood, of the circinate syphilides in which the rings of little papules almost always have in their centre a large papule pathognomonic of syphilis, but we refer to true syphilitic lichen in which all the eruptive elements are around the hair and of about the same size. In the latter case the papules are almost always disseminated without order, and when they are grouped it is in a manner much less pronounced than is the case with the elements of lichen scrofulosorum. It is known that their site of election is the lower part of the back, the loins, the upper portion of the buttocks. It is almost wholly in these places that they are sufficiently numerous and close together to form groups. Everywhere else, as upon the hips, abdomen, and limbs, they are, so to speak, always disseminated. It is not less true that at times the diagnosis is almost impossible, and that we must carefully examine into the other concomitant symptoms, those of tuberculosis or of secondary syphilis, in order to establish it.

Treatment.

First of all we must look after the general condition of the patient, place him in satisfactory hygienic conditions, give him tonic and antibacillary remedies. Thus cod-liver oil, either alone or with creosote, should constitute the medication of choice. It should be given in as large doses as possible. Kaposi recommends a mixture of pure iodine 0.15 cgm., and cod-liver oil 150. gm., of which two tablespoonfuls are taken daily. When the patient does not stand cod-liver oil well, we may give guaiacol or arseniate of soda.

Local Treatment.—Kaposi recommends inunctions to be made two or three times a day with cod-liver oil or some fatty body, rubbed in over the skin. He has seen improvement take place under this plan in the local as well as in the general condition, the eruption having disappeared within the space of three months.

It has seemed to me that the local application which has brought about the most rapid results is the cod-liver oil plaster, changed every twenty-four hours. At the same time bran or starch or salt-water baths should be taken, and the surface should be well rubbed with tar or ichthyol soap.

In the rare cases in which the dermatosis resists these measures, we are justified in employing more energetic agents, which are, however, to be carefully watched for fear of exciting too much irritation of the surface; such agents are oil of cade, alone or associated with mercurials, pyrogallic acid, salicylic acid, resorcin, ichthyol, and green soap. These various substances can be employed in the form of ointments or of plasters.

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BULLOUS AFFECTIONS.

BY

HENRY H. WHITEHOUSE,

NEW YORK.

BULLOUS AFFECTIONS.

In this class we will consider the following diseases: Pemphigus, Hydroa, Dermatitis herpetiformis (Duhring), and Pompholyx.

PEMPHIGUS.

The disease to which the term pemphigus is applied is, even in our present advanced state of dermatological knowledge, far from being established on a definite and satisfactory basis. Even as late as September, 1895, in a discussion upon the subject at the German Dermatological Congress held at Graz, Kaposi maintained his well-known views, denying the existence of such a disease as dermatitis herpetiformis and claiming that many of its forms belong to pemphigus. Rosenthal, who followed in the discussion, wholly opposed Kaposi, and though he did not regard pemphigus as a disease entity, he considered it a definite elementary form of skin eruption. He would, however, exclude from pemphigus diseases which only exceptionally assume bullous characters, such as bullous eczema, bullous urticaria, bullous iodide eruption, the various vesicular and bullous eruptions occurring in the course of the infectious diseases, those accompanying central nervous affections, etc. The term is so restricted by most authorities, that there should, at any rate, be no excuse for designating every affection of the skin in which bullæ constitute a prominent feature as pemphigus.

Precisely as eczema, a general class which formerly harbored almost every scaly and itching eruption of the skin, has diminished in frequency from thirty-three or more per cent. to about twenty or twenty-five per cent. of all cases of skin disease, so pemphigus, in proportion as our knowledge increases, presents an ever-lessening number of varieties.

Definition.

Pemphigus is a chronic affection of the skin, which runs a rather indefinite course and is characterized by the development of successive crops of bullæ rising abruptly from a non-inflammatory base.

It is an eminently rare disease, but in determining the frequency of its occurrence little reliance can be placed upon statistics for obvious reasons. It is interesting to note, however, that among 123,746

cases of general skin diseases recorded by the American Dermatological Association, pemphigus occurred 183 times, or in the proportion of about 1.5 per thousand. Crocker states that it occurs in the proportion of about 1 to 500 in England and America. Kaposi's statistics are proportionately high, namely, 4.1 per thousand, for reasons already stated.

As might be expected from the great diversity of opinion held in regard to the disease in past and recent times, very many varieties of pemphigus have been described. One observer, H. Martius, enumerated no less than ninety-seven separate types. In the present instance, however, we shall endeavor to describe the disease as it exists according to the understanding of most American authorities, though some varieties may be included, for purposes of elucidation, whose nosological position may still be uncertain.

Two main divisions of pemphigus are therefore made, (1) Pemphigus vulgaris; and, (2) Pemphigus foliaceus.

Pemphigus Vulgaris.

Symptoms.

General.—In many cases the onset of the eruption is unaccompanied by any constitutional disturbance. The lesions may develop slowly and in small numbers in an apparently healthy individual, who first becomes aware of their presence by a slight sensation of pricking or heat. This mode of invasion is usually confined to adults, but in children and old people there is generally a short but variable period of general malaise, and immediately preceding the outbreak moderate febrile disturbance, as chills, a rapid pulse, slight fever, nausea, and often vomiting. The temperature, which rarely rises more than two or three degrees, falls slowly with the subsidence of the lesions and suffers an exacerbation on the appearance of each fresh crop of bullæ. General prostration may result from the sleeplessness, pyrexia, anorexia, etc., accompanying the severe cases, in which there are successive and frequent outbreaks of bullæ, resulting in crusts and extensive excoriations.

Clinical Manifestations.—The lesions characterizing a typical case of pemphigus vulgaris consist in well-developed, round or oval-shaped, tense bullæ with clear and transparent contents, whose walls rise almost perpendicularly from the healthy skin. In cases in which it is claimed that the bullæ may at times develop upon erythematous patches or wheals, I believe that we have to do with erythema multiforme or with some other disease than true pemphigus. The bullæ may occur on any part of the body, often in a symmetrical manner,

but are usually more abundant on the face, limbs, and upper part of the trunk; the mucous membranes, as will appear later, may also be affected. The successive crops develop either discretely and irregularly scattered, or so closely aggregated that they often become confluent. They may be very few in number, only two or three, or there may be present at one time a hundred or more. Beginning primarily as a vesicle, about the size of a pin's head, evolution proceeds rapidly, the full size being attained in a few hours. The size may vary from one-eighth to one inch in diameter, or if the bulla does not retain its original size but enlarges rapidly either by its own growth or by coalescence with adjacent bullæ, blebs from two to three or more inches in diameter are formed. Confluent bullæ of these dimensions are usually quite irregular in outline.

Each individual bulla runs a pretty definite and typical course, its clear watery or straw-colored contents, in from one to two days, become cloudy or opaque, and as the purulent character becomes more marked the adjacent skin then presents a slightly inflamed appearance. Hemorrhages into the bullæ may also take place in rare instances (*pemphigus hæmorrhagicus*). After remaining stationary for a few hours or a day or two, involution begins, the fluid contents of the bulla are gradually absorbed, the walls collapse, and soon dry into a thin brownish crust. In the event of rupture an excoriated surface remains, covered with a bloody exudation, which, together with the wall fragments, soon desiccates and forms a dirty-brown scab. Healing takes place beneath the crust or scab and in a day or two it falls off, leaving new epidermis corresponding in area to the base of the bulla, of a bright-red color at first, but soon becoming pigmented. Inflammatory œdema and lymphangitis, extending to the nearest lymphatic glands, may result when the bullæ and crusts are closely aggregated and the pus is confined beneath the scales.

The subjective symptoms complained of are moderate itching, pricking, or burning, with a sensation of tension when the bullæ and crusts are numerous and crowded together. Pain and smarting may also be experienced when excoriations are produced by the accidental detachment of the scabs.

Course and Duration.

The duration of an individual bulla is but a day or two, but the successive development of fresh crops generally prolongs the disease to from two to six months. In the course of recovery the bullæ appear at longer intervals, are smaller and fewer in number, and finally cease altogether. Slight pigmentation, which lasts a few weeks, is the only evidence of their previous existence. The patient

may never have another attack, but more commonly relapses occur at intervals of a few months or even a year, ending in ultimate recovery; or the attacks may be of such a severe type and so frequently repeated that death may follow from exhaustion or septicæmic poisoning, from absorption of septic matter from large excoriated surfaces. Finally, certain cases of pemphigus vulgaris run into the more fatal form, pemphigus foliaceus.

Varieties.

The different varieties of this group, on the basis of their running a mild course with a favorable termination, or a severe one with a fatal outcome, have been arranged into two subdivisions, *Pemphigus vulgaris benignus*, and *pemphigus vulgaris malignus*. It seems sufficient, however, to know that certain cases get well and others do not, and we believe the employment of such terms only unnecessarily complicates an already vast and confusing nomenclature.

From the nature of the affection we would naturally expect great variations in the clinical types manifested. The accentuation in a particular individual of one or another of the clinical features already described would constitute a peculiar type or variation to which separate names have been applied. Some of these should, in reality, not be accorded the distinction of varieties, for the peculiarities exhibited are often merely accidental; for the sake of clearness, however, the most important ones are mentioned in this connection.

There are cases that run an extremely mild course, extending over a long period, in which the bullæ develop singly or two or three at a time at long intervals—*pemphigus solitarius*. These individual lesions may appear anywhere, but sometimes they are especially localized upon regions where the circulation is sluggish, as the toes, fingers, nose, etc.—*pemphigus localis*. Crocker mentions a case in a child in whom a bulla formed under each nail, partially detaching it from its base; these cases, however, are extremely rare. When the corium is exposed from excoriations, it may be covered with an exudate of yellowish lymph—*pemphigus crouposus*, or slight infiltration may occur with superficial sloughing—*pemphigus diphtheriticus*, and in the event of deeper sloughing we have what is termed *pemphigus gangrænosus*. Hemorrhages into the bullæ, as before stated, constitute *pemphigus hæmorrhagicus*. All these so-called varieties are simple pathological accidents, in the strict sense of the term, the difference being only one of degree and not of kind.

In addition to these, some authors mention other clinical types, which, however, we now consider to belong to another disease—dermatitis herpetiformis. One grave form, *pemphigus pruriginosus*, charac-

terized, as its name implies, by violent itching, develops from a primary erythematous patch or from an urticarial wheal. The tiny vesicle which forms on the lesion seldom attains the size of a bulla in consequence of the continued scratching; as a result we have infiltration, excoriations, eczematous or impetiginous crusts, etc., in fact all the lesions ordinarily produced by prolonged scratching (see *Dermatitis herpetiformis*). In another rare form, *pemphigus circinatus*, several vesicles develop around an old central bulla which dries up in the process of healing. The vesicles are arranged at first in a circle but later spread in a serpiginous manner, forming gyrate figures—*pemphigus gyratus, serpiginosus*. In this connection may likewise be mentioned two other forms which are purely symptomatic, namely, *pemphigus leprosus* and *pemphigus syphiliticus*. When bullæ occur in connection with leprosy they develop on the anæsthetic patches and often result in cicatrices. In syphilis bullæ rarely occur except in children hereditarily affected, and then they may be present at birth or develop after a few weeks. The reader is referred to the articles on these diseases in a later volume for fuller details.

After the lesions of pemphigus have healed, the development of large numbers of pearly milia have at times been observed. Such instances have been recorded by Crocker, Bärensprung, Hebra, and Kaposi. These are grouped on the limbs or trunk and remain weeks or months after the disappearance of the pemphigus.

Pemphigus Vegetans.

This is a severe and often fatal form of pemphigus vulgaris, and will therefore warrant more extended notice than was accorded any of the preceding varieties. Long before this type of disease was known to bear any relation to pemphigus, it was accurately described as a peculiar form of syphilis (*Frambœsia syphilitica*), and also as herpes. Kaposi (Kohn)[1] first recorded a case from Hebra's clinic under the title of "*syphilis cutanea papillomaformis (vegetans)*," and Auspitz[2] reported two cases under the name of "*herpes vegetans*." Neumann,[3] however, was the first to identify the disease with pemphigus, and the same author later[4] gave a full account of its clinical and anatomical features. Riehl, Hutchinson, Hyde, C. Müller, Szadek, Crocker, and others have since reported cases, so that its place as a special variety of pemphigus is now pretty definitely established.

The disease, which is an extremely rare one, usually first attacks a mucous membrane. The favorite points of inception are on the mucous membrane of the anus and external female genitals, as also the alæ nasi and the cavity of the mouth, particularly the soft palate,

and the lips. When it begins in the mouth there is much pain and difficulty in swallowing and the mucous membrane is dry and fissured. These lesions develop without prodromal symptoms and after a variable interval, usually two or three days, bullæ come out on the cutaneous surface. These differ in no way at first from the bullæ seen in ordinary pemphigus vulgaris, but in the process of involution variations from the usual type are manifested.

The bulla begins to desiccate in the usual manner already described, but a true scab or crust never forms, the surface remaining excoriated; at the same time other bullæ form around the original one and by progressive growth coalescence with adjacent lesions takes place, with the formation of serpiginous lines. The excoriated surface presents a red, moist, raw appearance and shows, as a rule, no tendency to heal, but enlarges by the development of new crops into moist, raw plaques the size of the palm or larger. Coincident with this extension, papillary or granulation-like excrescences form upon the denuded surface by epidermic proliferation and papillary outgrowth, which are soft and moist and of a raw-beef color. These fungoid growths secrete a thin, foul-smelling fluid, which decomposes rapidly and may become purulent; superficial necrosis may also take place. They develop most luxuriantly in localities where the skin is subjected to friction and moisture, as in the folds of the axillæ and groins and in the perineal or anal regions.

Cases of recovery are reported, in which instance the excoriated surface heals and flattens down, leaving a pigmented area surrounded by a serpiginous margin. The rule is, however, for the vegetations to spread progressively without formation of new epidermis, death occurring in a few months from exhaustion, inanition, or some intercurrent disease (nephritis, pulmonary œdema, etc.).

Earlier observers, as already stated, from the close resemblance of the lesions to syphilitic plaques (condylomata lata) were led to believe that it was a manifestation of that disease. It is, therefore, in consequence of its fatal tendencies, of the greatest importance from a diagnostic point of view.

Pemphigus Acutus.

In regard to the existence of an acute form of pemphigus vulgaris, there is wide diversity of opinion. We constantly see cases of bullous disease running an acute course and indistinguishable clinically from pemphigus vulgaris, but until we know more about the etiology and pathology of pemphigus their identity cannot be positively established. Knowing, as we do, that many vesicular and bullous diseases are wrongly included in the foregoing chronic form of pemphigus, it

is even more certain that a far larger number have been wrongly diagnosed as acute pemphigus. This is particularly true of such diseases as varicella bullosa, urticaria bullosa, hydroa, erythema bullosum, impetigo contagiosa bullosa, etc. The elder Hebra even denied the existence of acute pemphigus on these grounds, maintaining that the cases so termed were instances of mistaken diagnosis. Furthermore, certain mild forms of chronic pemphigus have undoubtedly been mistaken for this disease. With a full appreciation of all these difficulties, and granting the views of this distinguished observer to be correct in very many instances, there are yet cases observed which in the present state of our knowledge must provisionally be included in this category.

The disease, though occurring occasionally in adults, is much more frequent in childhood and infancy. It runs an acute course of a few weeks, with a short invasion marked by general malaise, chills, slight fever, nausea, and in children more or less diarrhœa. The efflorescences usually develop on an erythematous base and are preceded by slight itching; primarily vesicles, from a sixteenth to an eighth of an inch in diameter, they enlarge rapidly to bullæ of a half inch or more, but never attain a large size. They appear in successive crops, which are irregularly scattered over the body, limbs, or face; the eruptive stage reaches its full development in the first week or two. With recrudescence the fever subsides, fewer vesicles form, the older ones dry up, and slight pigmented spots remain.

The disease generally ends in recovery in from three to six weeks and is limited to one attack. In rare instances, however, it may run an extremely acute and fatal course, the patient dying in a very few days from the onset of the disease. The use of the term "malignant," which has been applied to these cases, is entirely warrantable. Crops of bullæ appear in such rapid succession and in such great numbers that a large part of the body surface is affected in a very short time, and there is also implication of the mucous membranes of the mouth and throat. A very high fever, with general prostration and exhaustion from the inability to eat, lead to the death of the patient in a few days or a week or two. A complicating albuminuria has been recorded in several instances; in a case of this kind, reported by Duckworth, the patient died with a high fever and in a typhoid state on the ninth day.

Pemphigus Acutus Neonatorum.

This is a form of acute pemphigus which occurs in new-born infants and may develop either sporadically or in an epidemic manner. It should not be confounded with syphilis, which occurs in a

bullous form in children congenitally infected. There is never any evidence of syphilis in these cases and the children are usually well nourished and apparently healthy. The disease begins with prodromal symptoms—a slight fever and more or less constitutional disturbance, followed in a few days by an eruption of bullæ, which display the same features in evolution and involution as those just described. They likewise are distributed irregularly over the body, limbs, and face, some beginning on the buttocks and thighs, others on the face, and still others on a mucous membrane.

The disease generally runs a short and favorable course, recovery taking place in from ten to fourteen days, though in rare cases it may assume a malignant type and terminate fatally. Tilbury Fox has described such cases, in which the contents of the bullæ become fetid, and deep gangrenous ulcers are formed, the disease being accompanied by severe constitutional symptoms, and terminating in death in from ten to twelve days.

Occurrence.

The sporadic cases of pemphigus neonatorum occur in children exposed to bad sanitary arrangements. Two of Crocker's cases were from a house where the drains were repaired during the confinement of the mother, and the latter had a sore throat which she attributed to an offensive water-closet. In the epidemic form, the so-called *pemphigus acutus contagiosus neonatorum*, the disease is limited to certain localities and occasionally invades lying-in institutions or foundling asylums. Limited epidemics have been observed in the practice of a certain midwife, but whether the outbreak in these cases can be ascribed to direct infection or, as Bohn thinks, to the influence of too hot baths, our present knowledge of the disease does not enable us to decide. Different epidemics of this nature have been reported by Thomas, Wickmann, Moldenhauer, Almquist and others, facts which together with those just given warrant a well-founded suspicion, at least, that pemphigus acutus is contagious. To state positively, however, that true pemphigus may occur in epidemics or by contagion would be an assumption of facts the proof of which at the present time is not forthcoming. There is reason to believe that very many of these cases are examples of varicella bullosa or of impetigo contagiosa bullosa.

From the fact that large epidemics have been observed following vaccination and that adults have acquired the disease from infants suffering from pemphigus neonatorum, Pontoppidan has advanced the opinion that impetigo contagiosa in children is identical with pemphigus contagiosus in the adult. P. Manson [1] has described a pem-

phigus contagiosus which is peculiar to the tropics and which appears in infants or adults. The clinical symptoms manifested in this disease resemble very closely those of impetigo contagiosa bullosa.

Riehl and Kaposi have found a mould fungus with spores and mycelia among the epidermic cells of the vesicle wall in a case of acute pemphigus. They believe this may throw some light on the question of contagion in pemphigus. Certain micro-organisms have also been isolated from the contents of the bullæ; Faber, Strelitz, Colrat, Almquist, and others have procured micrococci in this manner, though there is lack of uniformity in their observations. Pure cultures have been made and inoculations attempted; some have failed, others have produced vesicles or pustules. Almquist,* however, with a pure culture of a staphylococcus thus isolated, succeeded in producing bullæ. While no definite conclusions can be drawn from these observations, yet to bacteriological research, which has already been the means of solving many complicated problems in all branches of medicine, we must look, I believe, for a solution of the question of contagion in pemphigus.

Pemphigus Foliaceus.

Pemphigus foliaceus is the most severe and distressing of all forms of pemphigus and leads almost invariably to a fatal termination. Fortunately it is a very rare disease, being said to occur only once in five thousand cases of general skin diseases.

Symptoms.

It occurs most frequently in adults and as far as my personal experience goes is more common in women than in men. It may begin as an independent disease and run a distinct and typical course, or it may develop from a severe pemphigus vulgaris, as before stated. The disease is characterized by the development of flaccid bullæ of various sizes, which are easily ruptured revealing a red, moist, excoriated base which manifests no tendency to heal. At first only a limited area is affected, but it soon spreads and eventually becomes universal. The bullæ are never tense and well-filled as in pemphigus vulgaris, but are flaccid from the start; if the fluid is scanty the epidermis is only slightly raised and presents a wrinkled appearance, but if more abundant it accumulates at the most dependent part. The contents, at first turbid, rapidly become opaque and finally purulent.

The bullæ rupture very early in the disease and the adjacent epidermis is thrown into folds or lamellæ from progressive extension of the process peripherally. From the resemblance of these lamellæ of

detached portions of epidermis to dried leaves, the qualifying term "foliaceus" was originally applied by Cazenave. The excoriated surface after rupture of the bulla shows little or no tendency to heal; an attempt at formation of new epidermis may be made but it proves abortive and new epidermis is soon detached, exposing the red and moist corium. This exudes a scanty secretion—the lesions presenting very much the appearance of an eczema rubrum—which dries into thin yellowish crusts. Sometimes the exudation is more abundant, when larger and thicker scales are formed, but the crusts are all easily detached, leaving large areas of denuded corium. This is bathed in serous pus from which emanates a peculiarly fetid and nauseous odor. The process goes on by the continual formation of new lesions until in a few months, or perhaps years, the entire cutaneous surface is invaded, with literally no healthy skin to be seen.

The integument is fissured in an irregular manner, the cracks marking the intervals between the crusts, and we have mixed together over the entire surface large, moist, red excoriations, partly covered with crusts, irregular fissures, here and there a large flaccid bulla and, in places subjected to pressure, superficial ulceration. Furuncles and deeper ulcerations may also sometimes be found. When the surface is so generally affected the development of new bullæ is seldom observed, for there is very little epidermis to form the wall; they spring up beneath the crusts and rupture very quickly. In this advanced stage of the disease the nutrition of the hair and nails suffers. The hair on the scalp is almost entirely shed and the eyebrows and lashes fall, which together with ectropion of the lids, resulting from contraction of the epidermis, gives to the entire head a distinctly "scalded" appearance. The nails become thin, furrowed, and brittle and in some cases are shed entirely.

One is rarely called upon to witness a more distressing spectacle than that which these patients exhibit towards the end of the disease. The forcible removal of the crusts with tearing of the skin, and the continual exposure of fresh corium caused by the vain efforts of the patient to find a comfortable position, produce untold sufferings. The continued loss of sleep, the complete failure of the digestive powers, and a more or less continuous fever lead to extreme emaciation, and the absorption of septic matter from the extensively diseased surface finally causes death. The disease may extend over a period of several years with intervals of improvement, both in the condition of the skin and in the general health; but recovery cannot be expected, for if the patients do not die in the manner described they generally succumb to some intercurrent disease, either of the heart, lungs, or kidneys.

The Mucous Membranes.

The mucous membranes may be implicated in all forms of pemphigus; while this feature amounts only to an increase of the pain and suffering in most cases, in some it leads to very grave consequences. The mucous membranes of the mouth, soft palate, pharynx, and larynx are most commonly affected, more rarely the nasal, vaginal, and anal mucous membranes. When bullæ develop on these surfaces, maceration quickly takes place with the formation of irregular or circular patches surrounded by a white outline—the ragged attached circumference of the bleb. The patches may be bright red, but more usually they are of a gray color from the macerated and decomposing epithelium.

In ordinary pemphigus vulgaris regeneration of the epithelium generally takes place quickly, though dangerous symptoms of suffocation may arise when the lesions are seated in the larynx or on the epiglottis. It is only when the bullæ develop in a manner similar to those in pemphigus foliaceus that serious trouble may follow. The blebs are so numerous that they become confluent, producing patches which cover a large part of the mucous membrane of the mouth, pharynx, and larynx; the epiglottis may likewise be involved, and in rare instances the disease extends deep into the air passages. The diseased surface is very red and raw, or becomes exceedingly dry and glazed, presenting a reddish-brown color. The patient is in a condition of extreme danger, for there is no tendency to regeneration of the epithelium, swallowing is impossible, the voice is lost, and suffocation is imminent. In this form of the disease there is no hope of recovery.

Besides the mucous membranes just mentioned the conjunctivæ have in rare instances been the seat of pemphigus bullæ. The lesions are usually associated with those of the skin or of other mucous membranes, and are generally developed in the course of pemphigus vulgaris or pemphigus foliaceus. As a rare occurrence the conjunctivæ have been first attacked. Total blindness almost always follows, from adhesions of the bulbar and palpebral conjunctivæ, accompanied with "essential shrinking" of the membranes. A case of pemphigus of the mouth and conjunctivæ has been reported by Malcolm Morris and Leslie Roberts,[1] in connection with which they give a bibliography of conjunctival pemphigus to date. In pemphigus vegetans, as already mentioned, the mucous membranes are first attacked, and cases have occurred in which pemphigus was confined to the mucous membranes. The prognosis is usually grave.

Etiology of Pemphigus.

In a disease like pemphigus, in which no two observers, even at the present day, are in accord with regard to its limits from a clinical point of view, it is not strange that a uniform formulation of its causative factors is an utter impossibility. As a matter of fact, even an approach to this is as yet remote, our knowledge of its etiology being for the most part hypothetical. As far as we know, occupation, habits, nationality, climate, etc., do not enter as causative factors. *Sex* appears to have but little if any influence, inasmuch as the recorded statistics are contradictory on this point. The disease may occur at any *age*, though infants and children seem to be more liable to it than adults, if we include pemphigus neonatorum in this category.

Heredity undoubtedly acts, though rarely, as a predisposing factor. Kaposi records the case of a young man, twenty-two years old, who had pemphigus from early childhood; this patient stated that his mother, sister, maternal uncle, and half the latter's children had suffered with it. Malcolm Morris also treated three members of the same family for pemphigus.

It is in no wise certain that we should regard as instances of congenital pemphigus those cases in which there is a predisposition from birth to the formation of bullæ wherever the skin is subjected to traumatism or friction. Several cases of this kind, under the name of *epidermolysis bullosa hereditaria* have been recorded by Köbner, Legg, Blumer, Goldscheider, and Valentine. In these persons bullæ develop from the slightest friction as by the suspenders, waist-band, and particularly the shoes. I have seen two or three examples of this peculiar affection; in one, a young man of twenty-three, the patient was obliged to give up his work, for even moderate use of a hammer would cause large bullæ to form on the palm. His feet were severely affected and were likewise the seat of a marked hyperidrosis. He was very much worse in the summer and stated that he had suffered from early infancy, and that his father was troubled in the same manner. Aside from the sudden formation of bullæ, these cases bear no resemblance to pemphigus, but they are mentioned in this connection inasmuch as some authors regard them as forms of this disease.

That some relation exists between pemphigus and certain diseases of the nervous system there can be no doubt, though at present the exact cause and effect cannot be determined. This is evidenced by the occurrence of pemphigus sometimes in neurotic and hysterical patients (Kaposi), as also in the course of injuries and diseases refer-

able to the cerebro-spinal system. The theory of its being a trophoneurosis (Schwimmer) is evidently true in some instances. In no other way than by reflex irritation through excitation of the vasomotor or trophic nerves can Weir Mitchell's cases be explained, in which bullous eruptions followed injuries of the nerves, particularly those causing neuritis. Schwimmer likewise observed pemphigus following a traumatic zoster, and to an irritation of the vasomotor or trophic nerves may be referred those cases of leprosy in which bullæ occur; these latter are undoubtedly due to a direct irritation from leprous deposits. Pemphigus has been observed associated with chronic myelitis, acute spinal meningitis, etc. (Leloir, Chvostek, Déjerine, Brissaud, Ferraro, and others); also with progressive muscular atrophy (Balmer), and with locomotor ataxia.

Further evidence of the relations of pemphigus to the nervous system is shown by the pathological changes found in the cerebro-spinal and sympathetic system of nerves in some fatal cases of the disease. Jarisch, Schwimmer, Babes, and Déjerine have all found sclerosis of the columns of Goll in fatal cases of pemphigus; Déjerine, Quinquaud, Leloir, Jarisch, and Mott have found, in addition, atrophy and degeneration of the peripheral nerves; while Petrini,* in a histological study of the lesions found in three cases of pemphigus foliaceus, noted atrophy of the peripheral nerves without changes in the cord. Changes in the sympathetic nerve were also found by Stefanini and Marianelli.

Though the evidence here presented speaks pretty positively for the nervous origin of pemphigus, there occur very many fatal cases of the disease in which, by most careful histological research, absolutely no pathological nerve lesions can be found. N. Weiss and Kaposi examined the cord in nine fatal cases of the disease and in only one did they find a diffuse sclerosis, and in this instance the patient was cachectic and suffered from cirrhosis of the liver and cancer of the tongue. Moreover, chronic myelitis and the other nervous diseases mentioned are in the majority of cases not accompanied by the formation of bullæ or any of the symptoms of pemphigus. The only conclusion that can be drawn from the foregoing facts, therefore, is that pemphigus has a neuropathic origin in a very few instances, the greater number of the cases being due to other causes.

As already mentioned in connection with epidemic pemphigus, the question of contagion is far from being definitely settled. The possibility, however, of true pemphigus occurring in an epidemic form in children may reasonably be entertained. This fact, together with the occurrence of cases which run a very rapid and fatal course, has

led to the natural inference that the disease may be due to a specific micro-organism. Investigations in this line have accordingly been made by Paul Gibier, Demme, Spillman, and others. Gibier found beaded bacteria in the contents of the bullæ and in the urine; these, when fully developed, represented a chain of as many as twenty organisms. Spillman also found bacteria in large numbers in the bullous contents, in the urine, and, in acute pemphigus, in the blood. Demme demonstrated diplococci in the contents of the bullæ and in the blood and urine, of which he made pure cultures. Crocker found micrococci and bacilli in recent bullæ. The same difficulty arises in estimating the value of these observations that has been met with in bacteriological research in connection with other skin affections. The many varieties of micro-organisms that are found in the healthy skin having no pathological significance render the isolation of a specific germ a matter of the greatest difficulty. For these reasons we would not attribute, as yet, a specific etiological value to the bacteria here demonstrated, though future investigations of this kind, together with experimental inoculation, will undoubtedly throw much light on the subject.

The influence of chills in producing pemphigus foliaceus in some instances has been mentioned by several observers. Crocker records a severe case which was attributed to this factor. Schwimmer and others record similar cases. The old theory that pemphigus bullæ were produced by a vicarious excretion through the skin of urinary products requires only brief mention, inasmuch as it is an hypothesis with little foundation in fact. The discovery of uric acid, urea, free ammonia, etc., in the bullous contents in some cases, and the occasional association of pemphigus with renal disease, are mainly responsible for these views.

After a careful appreciation of the various possible causative factors here enumerated, not excepting the cases of symptomatic pemphigus occurring in the course of variola, syphilis, leprosy, etc., there still remain a very large proportion of the cases for which no definite cause can be found. In other words, pemphigus most frequently occurs in an idiopathic manner.

Pathology.

In view of the conflicting opinions that exist in regard to the nosological position and the etiological relations of pemphigus, as set forth in the preceding pages, little of a definite and positive character can be expected in a study of its pathology. That it is a trophoneurosis, as Schwimmer and others maintain, is true of some cases, but in our present state of knowledge the nervous system cannot be held

exclusively responsible (see *Etiology*). By whatever mechanism the lesions are brought about, most authorities regard the disease as a primary inflammation of the skin. The views expressed by Auspitz, however, seem to us to be more in accordance with the clinical features observed in every case. He considers it a mechanical lifting up of the epidermis by a sudden escape of fluid from the vessels, resulting in a destruction of the youngest prickle cells and a loosening of the prickle-cell layer. To this process the name *acantholysis* is given.

The one peculiar feature of a pemphigus bulla is that it arises suddenly from a non-inflammatory base. Redness and other signs of inflammation are absent, but if inflammatory symptoms do exist, we believe with Auspitz that they are secondary phenomena. The finding of a parenchymatous neuritis of the nerves beneath the bullæ in some cases by Déjerine and Leloir would seem to favor the non-inflammatory theory; as this change is generally the result of inflammation.

Careful analyses have been made, both microscopical and chemical, of the fluid contents of the bullæ, but such varying results have been obtained that the findings have no pathological meaning. All agree that blood serum constitutes the greater part of the fluid, which as a rule is neutral or faintly alkaline in reaction. A few scattered leucocytes are found in it when clear, and when it becomes turbid or opaque pus cells and red blood globules can be demonstrated. The various micro-organisms that have been found in the bullous contents have already been considered while studying the etiology of the disease and in connection with pemphigus acutus neonatorum. The chemistry of the fluid presents great variations. Serum albumin, paraglobulin, and phosphates are constant elements. Bamberger and Beyerlein found free ammonia; on the other hand, Heinrich discovered free acetic acid. Lactate of soda, chlorides, cholesterin, leucin, tyrosin, urea, and crystals of uric acid have been found by various observers.

The urine of patients suffering with pemphigus shows nothing abnormal by careful chemical and microscopical analysis. Bamberger, however, found free ammonia in an acid urine. Diminution of urea is marked in some cases but it is by no means constant. The examination of the blood reveals nothing pathognomonic. In severe cases with anæmia the usual diminution of the blood corpuscles of that condition is found. Little importance can be attached to the micro-organisms found by Spillman and Demme. An increase of the eosinophile cells was found in an examination of fourteen cases in Kaposi's clinic by Lukasiewicz and Gollasch, but this observation is

not confined to pemphigus. The various changes that have been found in the liver, spleen, and other internal organs are presumably a part of the general cachexia.

Among the complications that can be mentioned are pneumonia, acute Bright's disease, tuberculosis, and ulceration of the intestinal follicles.

Morbid Anatomy.

In the majority of cases the position of the bullæ is very superficial, though occasionally they are found more deeply situated. In the former, the roof is formed by only the most superficial layers of the horny cells, and hanging from the under surface like stalactites are conical epithelial prolongations which are the torn linings of the follicles. The base is formed by the rete, the cells of which are stretched into wide meshes by the outpouring of serum, which, as it accumulates, ruptures the trabeculæ with the formation of a single cavity. The papillæ beneath the bullæ are infiltrated with serum, resulting in the formation of wide spaces. In the deeper-seated bullæ the roof is composed of the horny layer and about the upper two-thirds of the rete (Crocker). The lower rete cells are stretched and finally separated from the corium; by a continuance of the process these are destroyed, and the upper layers compressed to form the roof. Crocker also found compression of the fibres of the corium below the bullæ, and round-cell infiltration of the upper layers. The absence of scarring is in keeping with the usual superficial site of the lesion; Steiner, however, observed scars in one case of pemphigus vulgaris.

Diagnosis.

Great care should always be observed in arriving at a diagnosis of pemphigus, but with a knowledge of the few distinctive features of the disease no difficulty should be experienced The bullæ of pemphigus appear suddenly, apparently without cause, and are not preceded by other lesions, such as papules, pustules, erythematous patches, etc., nor are these found associated with the bullæ. The lesions are seen in various stages of development, some being full and tense, others undergoing absorption and drying up into scabs, while pigmented spots are found here and there marking the sites of earlier lesions. The history of former attacks of the same nature extending over a period of months or years will generally establish the diagnosis. In adults there is usually no constitutional disturbance, but it must be remembered that in children the constitutional and febrile symptoms are often very pronounced.

It should not be difficult to differentiate pemphigus from the bullous forms of *erythema exudativum multiforme*, in all of which there are accompanying inflammatory symptoms. Moreover, these run a pretty definite and short course, the bullæ form on an erythematous papule or plaque and are associated with the other lesions of the disease, which incline to special localization. The "target" appearance of *herpes iris* with a central bulla surrounded by differently colored circular zones can be mistaken for nothing else. In *urticaria bullosa* the bleb develops on a wheal, and the accompanying itching distinguishes it from pemphigus. In *bullous eczema* there is always much itching and abundant lesions of ordinary eczema are invariably present. In *varicella bullosa* the course is short, and cases of the ordinary type can usually be found in the neighborhood.

Pemphigus is sometimes simulated very closely by the application of blistering agents, as cantharides, chloroform, etc., in the hands of the insane, by malingerers, and hysterical women; there is little difficulty usually in recognizing this form of deception. The bullous eruptions occasionally produced by the administration of arsenic, iodide of potassium, and other drugs disappear upon the withdrawal of the remedy. In *dermatitis herpetiformis* there is intense itching and the lesions are polymorphous—papules, vesicles, bullæ, pustules, erythematous patches, and evidences of violent scratching are usually present. As already stated, pemphigus pruriginosus is considered a type of this disease (see *Dermatitis herpetiformis*). *Impetigo contagiosa bullosa* is sometimes mistaken for pemphigus. I have seen instances of this disease occurring in adults in which the resemblance was very close, but distinct pustules can generally be found, and antiseptic local measures quickly arrest the progress of the disease. In children, impetigo contagiosa often develops in an epidemic manner and its possible identity with pemphigus acutus neonatorum has already been considered.

A *bullous syphilide*, the form the disease often takes in congenitally infected infants, may be mistaken for pemphigus neonatorum, but the marked cachexia and other evidences of the disease, and the fact that bullæ develop on the palms and soles, serve to distinguish it. The so-called *pemphigus leprosus* can be distinguished by the occurrence of anæsthetic patches upon which the bullæ form, and by the cicatrices which follow. *Syphilitic condylomata*, as already mentioned, have been frequently mistaken for pemphigus vegetans. The history of infection, the present or past evidences of syphilis, the entire absence of bullæ throughout the whole course of the disease, the natural tendency to involution of condylomata, and their disappearance under antisyphilitic treatment, all serve to distinguish them

from pemphigus vegetans. Moreover pemphigus vegetans always advances progressively and usually terminates fatally.

Pemphigus foliaceus may sometimes be confounded with eczema rubrum, pityriasis rubra, and the universal form of psoriasis. In *eczema rubrum* the scales are not often very large, the disease rarely becomes universal, which is the rule in pemphigus foliaceus, there is no history of previous bullous lesions, and the exudation is much more marked. It sometimes requires most careful search by daily observation to discover a distinguishing flaccid bulla in pemphigus foliaceus; the failure in such discovery, however, would establish the diagnosis of eczema rubrum. In *pityriasis rubra* and *universal psoriasis*, the scales are very thin and papery, and there is no exudation, the skin being dry and hot; most careful search will likewise fail to reveal the characteristic bullæ of pemphigus foliaceus. In psoriasis the history of typical lesions earlier in the disease can generally be obtained.

Prognosis.

We have no means of telling beforehand what will be the final outcome of a given case of pemphigus, the prognosis should, therefore, be very guarded. It may often be made with some certainty as regards a given attack, but relapses are sure to occur sooner or later, the frequency and severity of which cannot be foretold. Many cases of pemphigus vulgaris recover, but a favorable prognosis should be entertained only after due consideration of the general condition and age of the patient, and the length of time the disease has lasted. The longer the duration of the disease the less favorable is the prognosis, for severe complications may arise and a certain number of the chronic cases develop into pemphigus foliaceus, which is usually fatal. The prognosis is generally bad in very old people, who frequently die from exhaustion or from some intercurrent disease.

In acute pemphigus in young children and infants, the prognosis should be based on the severity of the constitutional symptoms and the extent of surface involved. As a rule the disease runs a favorable course in these cases, but it must be remembered that it sometimes assumes a malignant type, destroying the patient in a few days, and when deep gangrenous ulcerations occur a lethal termination is almost inevitable. The occurrence of albuminuria is also a bad omen.

Pemphigus vegetans is almost invariably fatal, the patient dying in a few months from exhaustion, inanition, or from some intercurrent disease. Pemphigus foliaceus is likewise nearly always fatal, though the disease may often drag on for years. In all the cases that I have seen death has been the invariable result, but recovery does some-

times occur, and the outlook is becoming brighter in both pemphigus vegetans and pemphigus foliaceus, with the advances in therapeutics that are being made.

Treatment.

In the treatment of pemphigus no definite rules can be laid down, in consequence of its uncertain etiology and its occurrence in the majority of cases in an entirely idiopathic manner. There is also no specific remedy which has a direct curative effect upon the disease, our treatment for the most part being purely symptomatic.

Among the *internal* remedies that are of value, arsenic preëminently occupies first place and comes nearer being a specific in this disease than in any other affection of the skin. It is of most value in pemphigus vulgaris, especially in the acute pemphigus of children, and of little or no service in pemphigus foliaceus. While it is the most reliable remedy we have, it fails often enough in its action, besides having its field of usefulness narrowed by the occurrence of many cases in which its employment is contraindicated. Chief among these may be mentioned subjects in whom the digestive powers are weak, or who exhibit distinct gastro-intestinal symptoms. Arsenic should be administered when possible in solution, either in the form of Fowler's solution or liquor sodii arseniatis. I prefer the latter preparation as it is generally better borne by the stomach. It should be given in slowly increasing doses until it exerts a control over the disease, or until the point of tolerance is reached. Small and frequently repeated doses, as recommended by Bulkley, have proved most effective in my hands, beginning with three to five drops of the soda salt every two hours, increasing each dose by one drop every second day until ten, twelve, or even fifteen drops are taken every two hours. I have also used arsenic with good results in the form of Asiatic pills, beginning with one three times a day, increasing slowly until six or even eight are taken daily.

Quinine is often of benefit in pemphigus and should be tried when arsenic fails or in cases in which it is contraindicated; it is necessary to give it in large doses. To opium in small doses is given the credit, by Hutchinson, of controlling severe cases of pemphigus vegetans and of curing mild ones. Belladonna and its alkaloid atropine have proved effective in some cases, principally in pemphigus pruriginosus; as this disease is a manifestation of dermatitis herpetiformis, however, these remedies cannot be said to have much influence upon pemphigus.

General supporting measures are necessary in all cases of pemphigus, and this often does more to control or cure the disease than

any other form of treatment. It consists in the employment of general and special tonics, together with attention to the diet, and proper hygienic observances. Iron, cinchona, cod-liver oil, strychnine, and phosphorus may be mentioned as especially serviceable. The diet should be of the most strengthening character, and no restriction in regard to any special article or class of food-stuffs is required or advised. Of course liquid diet is alone feasible when the mouth is severely affected, but this must be made as nourishing as possible. The patient should be placed in the best hygienic surroundings, including good air, rest of mind, and freedom from excitement as far as possible.

In the *local* treatment of pemphigus, the physician is often called upon to use all the tact and ingenuity at his command to make the patient comfortable. Nearly every application causes pain in the bad cases, and it is with the greatest difficulty that a preparation can be found which will give comfort or relief to the patient. It is generally advisable to relieve the tension of the bullæ by puncture with a needle at the side, whereby a covering is afforded to the excoriated base, and if this is not accidentally torn off, healing often takes place beneath it. Various dusting powders, such as oxide of zinc, starch, lycopodium, fullers' earth, etc., are often advocated, but in my experience, except in very mild cases, they generally add to the distress by forming hard cakes. These often adhere tenaciously, and I have seen severe inflammatory symptoms produced by decomposition of the confined secretions. Lotions are the most grateful applications to the majority of patients, and I would particularly recommend a six-per-cent. watery solution of ichthyol, followed by the application of calamine and zinc lotion. A lotion of borax and glycerin, or weak solutions of the lactate or subacetate of lead, are likewise of service. A watery mixture of carbonate of magnesia and oxide of zinc, in the strength of three per cent. of each ingredient, is useful in drying up the discharges. None of the lotions here referred to can be relied upon exclusively, for after a time much soreness and stiffness are produced by their drying effect, and then certain oily preparations are of great benefit. A three- to five-per-cent. carbolized oil serves a useful purpose in this stage, and also applications of the glycerite of starch weakly carbolized. I have obtained the best results, however, especially in pemphigus foliaceus, by laying on cloths soaked in a ten-per-cent. solution of ichthyol in carron oil. Sherwell reports great benefit in pemphigus foliaceus from the external and internal use of linseed oil.

Ointments afford relief in a certain proportion of the cases, but they must be soft in consistence. Boric acid (1:8), four per cent. of

calamine, five per cent. of ichthyol, or three per cent. of sulphur, all in rose-water ointment as a base, are to be recommended. An ointment of carbolic acid, gr. v., glycerin, ʒ i., lanolin, ʒ ij., and vaseline, ʒ vi., has proved most grateful in many instances.

When the mouth is severely affected, antiseptic washes and sprays should be employed, among the most serviceable of which are weak solutions of permanganate of potash, glycothymoline (Kress), suitably diluted, and a wash of salicylic acid and borax with a half per cent. of carbolic acid.

In all forms of pemphigus, it is generally not advisable to attempt to cleanse the surface by means of baths. Local disinfecting measures and the oily applications already indicated usually afford much relief, especially in severe cases of pemphigus foliaceus, and they also serve to keep the surface clean. It may be remarked here that it is always advisable to place patients with pemphigus foliaceus upon a water-bed as soon as practicable.

The system of continuous medicated baths advocated by the Vienna school, and applicable to the severe cases of pemphigus foliaceus and pemphigus vegetans, seems to be a highly practical and scientific method of treatment. This plan is obviously not feasible in private practice, and as far as I know no hospital in this country has fully adopted it. It consists in the continuous immersion of the patient, night and day, in a bath kept at a uniform temperature by means of running water. In this way the general condition of the patient is greatly improved in consequence of the relief from pain, together with the return of the sleep and appetite, thus materially prolonging life. Kaposi in this manner kept a patient alive for four years, he having passed at one time eight consecutive months in the bath. Various medicaments have been used in these baths, as alum, sulphur, permanganate of potassium, tannin, corrosive sublimate, etc., and I would venture to suggest that creolin would prove very beneficial.

HYDROA.

Originally the term "hydroa" (derived from ὕδωρ, water) was applied to a great variety of vesicular and bullous affections which were met with from time to time, but which could not be identified with any of the known dermatoses, in consequence of certain differences in the clinical features they displayed. In other words, it was a "catch-all" for all those eruptions that had certain features in common with pemphigus and herpes, but were too atypical to warrant classification with them. Bazin * focussed the subject somewhat, and

revived an interest in it by arranging these anomalous types into three classes—namely, *hydroa vésiculeux*, *hydroa bulleux*, and *hydroa vacciniforme*. For a period of eight years or more following Bazin's efforts at classification little or nothing was done towards a further elucidation of the subject, but gradually the thread was taken up by various dermatologists, principally of the English, American, and French schools. The Germans even now do not fully accept the term, and have done practically nothing towards the solution of the problem. As a result of the interest thus taken in the subject, hydroa has been confined within comparatively narrow limits.

It was found and subsequently acknowledged by Bazin that his hydroa vésiculeux was identical with erythema and herpes iris, which have already been considered under erythema multiforme. Hydroa bulleux is pretty generally acknowledged to be only a phase of Duhring's dermatitis herpetiformis or the hydroa herpetiforme of Tilbury Fox and Crocker, a description of which will presently follow. Hydroa vacciniforme, the last of Bazin's varieties, is conceded to be identical with Hutchinson's "recurrent summer eruption" and would seem to be the only disease to which the term hydroa, at the present day, ought rightly to be applied; Unna prefers the name *hydroa puerorum*. Although some authors still apply the term hydroa to a variety of affections and conditions, we prefer to use it in the restricted sense here indicated, inasmuch as most dermatologists consider these as belonging to other well-defined diseases.

Hydroa Vacciniforme (Bazin).

Synonyms.—Recurrent summer eruption (Hutchinson); Hydroa puerorum (Unna).

This is a rare disease, for since Bazin's first description of it in 1855, which was made from a single case, comparatively few examples of it have been recorded, and these mainly by English and German writers. As far as I am aware but one case has been reported from this country, that of Bowen.[10] Hutchinson[11] described the disease under the title already indicated. Unna[12] reported two cases, and Handford[13] gives a personal case. Instances have likewise been recorded by Jamieson, Berlinger, Buri, Boeck, and Crocker. The last-mentioned observer gives a good description of the disease in the latest edition of his book, in connection with which he states that he has seen two cases himself. As no instance of the affection has come under the writer's notice, the description here given, though somewhat abridged, will follow closely that of Crocker. The close resemblance which the lesions of this disease sometimes bear to vaccination vesi-

cles, and the fact that they nearly always terminate in scars similar to those of variola, lead to the adoption of the name "vacciniforme."

Definition.

An inflammatory recurring skin eruption, which is observed principally in the summer and is characterized by the appearance of vesicles arranged singly or in groups on an erythematous plaque, situated chiefly on the exposed parts and terminating in scars.

Symptoms.

The eruption is generally accompanied with slight constitutional disturbance, and is preceded by burning or pain in the region to be attacked, with a sensation of fullness, but not itching. Red spots first appear, upon which vesicles develop, either isolated or grouped like a herpes, and these may become confluent. The larger vesicles may become umbilicated, and the sunken centre as it dries forms a thin darkish scab surrounded by a ring of fluid, beyond which is a narrow red areola. Some of the vesicles do not behave in this typical manner, but either dry up in a day or two leaving a thin scab, or they rupture and leave a yellowish crust; in rare instances they may become purulent. When the scab falls off a red, depressed scar remains, which slowly becomes white and resembles closely the pitting of small-pox. Occasionally there is no scarring, the lesion not developing beyond the erythematous stage, but this is exceptional.

The duration of a lesion is generally three or four days, but the separation of the scab may be delayed in proportion to the depth of the process; the disease as a whole lasts from two to three weeks, from the successive development of fresh crops of lesions. Itching is said never to be a prominent feature, but Bowen's case was marked by severe itching. The regions usually attacked are the face—principally the bridge of the nose, the forehead, and cheeks—the sides of the neck and the ears, the backs of the hands and wrists. Exceptionally the lower legs and the extensors of the arms and forearms are attacked, and it has been known to occur, though sparsely distributed, on regions covered by the clothing. Most patients are comparatively free in the winter, the attacks coming on in the summer months; occasionally the disease develops in cold weather. The affection begins in early life, usually before the third year, and the attacks become milder towards puberty and cease altogether in adult age.

Etiology.

The etiology of the disease is obscure. It occurs almost exclusively in boys and begins very early, usually from the first to the

third year, though Bowen's case began at five, Crocker's two cases at five-and-a-half and seven respectively, and Jamieson's at thirteen. Exposure to the sun's rays and to the influence of cold winds are powerful exciting factors. Artificial heat is also said to be an exciting cause, and Unna attributes attacks in one of his cases to the influence of cold and sea baths.

Pathology.

Nothing is known of the manner in which these lesions are produced, presumably through the action of the sun's rays. Histological studies were made by Bowen of lesions taken from his case, representing both the primary and advanced stages of the process. The early lesion displayed the characteristics of a vesicle situated in the middle layers of the rete, and no necrotic cells were to be found. In the older lesion there was a necrosis at the centre, extending the entire depth of the corium and nearly to the subcutaneous tissue. He concludes that the disease is a primary inflammation in the upper part of the corium and epidermis, and that the rapid necrosis of the corium is a secondary phenomenon. Further study is needed to establish the true relationship of these processes.

Diagnosis.

The distinguishing features are the symmetrically arranged discrete, or grouped vesicles, situated on the exposed parts, and showing a tendency to umbilication, with the ultimate formation of variola-like scars. When a disease beginning in very early life, especially in males, presents such lesions, which in addition show a tendency to recur in the summer from exposure to the sun and wind, the diagnosis of hydroa vacciniforme is almost certain. The diseases most likely to be confounded with it are lupus vulgaris, lupus erythematosus, and syphilis. *Lupus vulgaris* shows no tendency to spontaneous cure in a few weeks and the scars are not symmetrical. *Lupus erythematosus*, though symmetrical, rarely occurs in childhood, is more common in females, is generally worse in the winter, and leaves superficial atrophic scars. *Syphilis* in the early pustular variety is not limited to the exposed parts of the body, it does not often begin in childhood, it is usually seen only in very severe forms of the disease, and there would surely be present other well-marked signs of syphilis; there would, moreover, be no tendency to seasonal recurrence.

Prognosis.

This is unsatisfactory. From individual attacks recovery is spontaneous, but indelible scars are an almost inevitable sequence, and

annual recurrences are to be expected. Promise can be given of intervals of freedom during the winter, with lessened severity at puberty, and cure at manhood.

Treatment.

This has not been very successful. The patient should guard against exposure to the sun and wind, as well as to artificial heat. Unna recommends the use of red or yellow veils which serve to neutralize the chemical rays of light. Further treatment is either empirical or symptomatic. Arsenic should be tried, and perhaps quinine and belladonna. Crocker would puncture each vesicle early, and apply iodoform-ether, or the powder itself, in the hope of preventing scarring. Antiseptic applications, in the form either of lotions or ointments, should be employed as for other similar skin lesions.

DERMATITIS HERPETIFORMIS (Duhring).

Synonyms.—Hydroa herpetiforme, Hydroa pruriginosum (Tilbury Fox); Hydroa bulleux, Pemphigus arthritique (Bazin); Herpes gestationis (Milton and Bulkley); Herpes circinatus bullosus (Erasmus Wilson); Pemphigus pruriginosus (Chausit and Hardy); Pemphigus circinatus (Rayer).

The great advances that have been made in dermatology during the past ten or fifteen years are perhaps nowhere more apparent than in connection with the erythematous and bullous affections. Nothing has been done, too, in connection with them that is of more practical importance than the grouping under one head—dermatitis herpetiformis—as special and distinct varieties, of various erythematous, vesicular, and bullous disorders of the skin which were formerly described as separate diseases, from the want of a comprehensive knowledge of their true relations. While the studies leading up to this change were begun by Tilbury Fox [14] in 1880, in a paper entitled "A Clinical Study on Hydroa," to Duhring is due the credit of recognizing the true relations existing between the several types, and of creating out of them a new disease. Duhring anticipated this important revision as early as 1881 in the second edition of his book, while treating of impetigo herpetiformis, but not until three years later did he fully make up his mind in regard to it. His first brochure [15] gives us a clear conception of the disease as we know it to-day, except so far as relates to the identification of impetigo herpetiformis with its pustular variety. This relationship we think is not at all certain, and Duhring himself subsequently withdrew, though provisionally, his statement in regard to it.

The important contributions that have since been made by Duhring and others, especially those of the French school, foremost of which is Brocq's masterly presentation of the subject," have practically insured for the disease a permanent place among affections of the skin. It should be remarked, however, that it still meets with opposition from some authors, especially from Kaposi who completely ignores it.

Definition.

A rare, chronic, inflammatory and relapsing disease of the skin, characterized by an eruption composed of multiform lesions—erythematous patches, wheals, papules, vesicles, pustules, or bullæ, which develop in successive crops, alone or variously mixed one with another, and occur often in groups; these are accompanied with intolerable itching and more or less constitutional disturbance, and are followed by pigmentation.

Symptoms.

General.—All forms of the disease are usually ushered in by slight constitutional disturbance, which precedes the outbreak by a day or two. In mild cases there is little more than malaise, anorexia, and constipation, but in those of a severer type there is in addition more or less fever, with alternating sensations of chilliness and heat. Itching of greater or less intensity referred to the region to be attacked is generally experienced a few days in advance, and is often the first symptom manifested; it frequently enables patients to tell beforehand when an attack is impending. All these symptoms, with the exception of the itching, generally subside with, or shortly after, the appearance of the eruption, but in some of the severe types they may persist even in a more aggravated form throughout the course of the disease. The majority of the patients, however, show no impairment of either the functional or somatic health, and frequently remark that they would be perfectly well in every way were it not for the tormenting skin affection.

Clinical Course.—The onset of the eruption, whatever form it may take, erythematous, papular, vesicular, pustular, bullous, or a combination of several or all of them, may be either gradual or sudden. Most of the cases I have seen developed very atypical lesions, sparsely distributed, for some weeks before any general type was declared; in this stage diagnosis is practically impossible, the lesions being often more like an urticaria than anything else. The likeness is made still more striking by the presence of intense itching which accompanies all cases. Groups of vesicles may occur, however, in addition to the

lesions resembling urticaria, which tends to make the case still more confusing. When the onset is sudden, one or another of the special types of the disease or a combination of the lesions of several varieties may cover a large part of the surface in a few days.

There is no regularity in the form the disease may take in its subsequent course. Multiformity of lesions is the rule in a great majority of the cases, and though a single type may predominate for a certain period, there is always a tendency to change to another variety. In this way a given case may exhibit erythematous, papular, or vesicular lesions for a while, then later in the disease, or in the course of a relapse, bullous or pustular lesions may be manifested almost exclusively. In all forms the eruption has a disposition to appear in successive crops, which are sometimes of a slight and at other times of a severe character.

The distribution of the eruption is as variable as are the lesions composing it. No part of the body surface is exempt, and all parts are almost equally liable to it. It may begin on the trunk or on the limbs, and may spread over the entire surface or remain limited to one region. The flexor and extensor surfaces of the limbs are equally liable; the face, scalp, and even the palms and soles may likewise be involved. Itching, usually of an intense character, is almost invariably present; it produces intolerable suffering when the eruption is extensive, and is of a most violent character at each fresh efflorescence. Excoriations always appear sooner or later in consequence of the scratching, and in old cases there is considerable thickening of the skin, which may present a more or less eczematous appearance. Pigmented areas of greater or less extent, varying in color from a dirty-yellow to a coppery-brown, are a constant feature, and the discoloration is generally very persistent.

The disease almost invariably runs a very protracted and continuous course with exacerbations. There may be intervals of weeks or months of comparative freedom, but relapses are the rule, whereby the disease is often made to extend over a number of years. The patients are frequently much reduced by the suffering which the disease entails, but a fatal result is a very rare occurrence.

Special Types.

Erythematous.—This form of the disease is not so well defined as some of the other varieties; it is more often, in my experience, the primary manifestation of one or another of the types mentioned. It may remain several weeks before developing further, however, and as it then often presents difficulties in diagnosis, a description of its clinical features is of importance.

It is characterized by the appearance, generally in crops, of erythema in the form of patches or in more or less diffuse areas. These may be macular, in which case they are better seen than felt; or more commonly, there is œdematous infiltration with elevation into flat plaques, or into distinct urticarial wheals. Accordingly, the eruption may simulate very closely erythema multiforme, erythematous eczema, or urticaria. The patches vary in size and shape, are often quite irregular in outline, and may be well-defined or fade gradually into the surrounding skin. They are scattered here and there over the surface, and may coalesce with neighboring patches forming areas with irregular, marginate borders, or they may remain discrete, in the form of either flat infiltrations or ringed lesions. In the latter case, small vesico-papules sometimes develop on the raised border, in which instance the patch has the appearance of a beginning herpes iris. The color of the lesions is primarily a bright red, but it fades gradually to a dull red or yellowish-brown shade, and later on pigmentation is present. The intense itching which always accompanies the eruption will serve to distinguish it from erythema multiforme. When the urticarial element is marked, acute œdematous infiltration may be present in a more or less diffuse form, or distinct wheals may be seen scattered here and there among the lesions already described. An extensive outbreak of the eruption is generally preceded by slight constitutional disturbance, such as general malaise, chilliness, and mild fever, which may continue for a short time after it is fully developed. The subsequent course of the disease is variable; it may remain in this form for a period of days or weeks with intervals of improvement, or, as already stated, it may pass into some other variety. In some instances the erythematous type of the disease is first manifested as a relapse in the course of one of the other varieties, but this is not the usual course.

Papular.—This is the mildest form in which dermatitis herpetiformis appears, and is at the same time the most uncommon variety met with. A case in which papules are the exclusive lesions manifested is a very rare occurrence. I have not yet seen such an instance, they being generally associated with vesico-papules, vesicles, or erythematous lesions. The disease in this form is characterized by the development of irregularly shaped, ill-defined papules, varying in size from that of a pin's head to that of a split pea, and occurring generally in small groups distributed over the body. There is nothing characteristic about their color, their consistence is rather firm, and they resemble at times the papules of erythema multiforme, some forms of papular eczema, or a group of abortive herpes zoster

lesions. The scratching which the severe itching invokes causes excoriation of the papules with the formation of blood crusts; in some cases, however, the lesions are covered with thin adherent scales. The inflammatory symptoms are acute or subacute in character, and the lesions develop slowly, run their course in from one to four weeks, and are commonly followed by pigmentation.

While the disease may occasionally run this typical course, displaying only papular lesions throughout, it is well to remember that it is the rare exception, for sooner or later some other type of lesion develops. The papules are, therefore, often seen associated with vesicles, vesico-papules, pustules, erythematous patches, or circinate erythematous lesions, and as relapses are the rule the disease may be prolonged weeks, months, or years. Very frequently the eruption conforms to the papular type in the relapses.

Vesicular.—Vesicles are not only the most constant lesions exhibited in all forms of dermatitis herpetiformis, as the name would seem to signify, but the true vesicular type of the disease is the one most frequently met with. The great variation in the size and shape of the vesicles characterizing the affection is a peculiarity which is of prime importance from a diagnostic point of view. In a given attack, vesicles so tiny that they can scarcely be seen are found associated with others varying from the size a pin's head to that of a split pea. They may be flat or raised, and are generally of a very irregular outline—stellate, quadrangular, elongated, etc., though sometimes they are rounded. They are usually pretty firm and well distended with fluid, which at first is clear but later often becomes opaque, assuming a semi-purulent character. They present a glistening, translucent appearance in the early stage of their development, but as the contents change in character they become pearly or pale-yellow in color. In the early, translucent stage, when they are generally very minute, they are quite easily overlooked, for they are nearly level with the surface and of about the same color as the healthy skin. They occur in small groups of only three or four lesions, and develop on healthy skin or more usually upon an erythematous base, thereby simulating groups of herpes zoster lesions. Several crops of vesicles may appear in rapid succession, in which case the skin may become more or less extensively reddened and thickened. The individual vesicles develop rather slowly, attaining their full size in several days or a week, and they are usually unaccompanied by an areola.

The distribution of the eruption is variable, but as a whole it is disseminate and may involve any part of the surface. Though occasionally profuse, invading nearly the entire integument, it is more commonly sparsely distributed over the back, chest, neck, and limbs;

frequently it is limited to one or more regions as the trunk or limbs. The tendency of the lesions to appear in groups or small patches, separated by areas of healthy skin of greater or less extent, is a peculiar feature of the disease. Closely adjacent groups incline to coalesce, forming irregular, multilocular vesicles or even small bullæ. A slight inflammatory character is usually assumed by the lesions in this event, in the form of a more or less distinct red areola surrounding the irregular, angular vesicles or blebs. These confluent patches generally present a puckered or drawn appearance. The walls of the vesicles in dermatitis herpetiformis are tough, and spontaneous rupture does not occur, but they disappear slowly by absorption of the contents. When ruptured by scratching, the lesion dries up into a thin scab; but excoriations are not so prominent a feature as in some of the other varieties. When the crust falls off a reddened base is left, which fades slowly and is followed by more or less pigmentation.

The subjective symptoms are itching and burning, and while both are complained of by some patients, the itching is always the most prominent symptom. It is peculiarly violent in character, more so than in any other variety of the disease, and is very persistent. The only relief the sufferer often obtains is through rupture of the vesicles by scratching. It is usually out of all proportion to the amount of eruption present, a marked contrast to that which is observed in erythema multiforme, and it is not approached in severity by that of any other skin affection. In spite of the constant and violent scratching that these patients indulge in, the true "scratched skin" is rarely observed. The eruption is unaccompanied by constitutional disturbance, though in the severer outbreaks it may be preceded by general malaise, slight fever, chilliness, etc.

The subsequent course of this type of the disease is not always uniform, though in every case it is long and tedious. There may be intervals of comparative comfort but not usually of complete quiescence, and the affection tends to go on from bad to worse, generally conforming to the same type throughout. In some cases, however, it may develop into one or another of the varieties mentioned, more commonly the multiform. *Herpes gestationis* is probably identical with this variety of dermatitis herpetiformis.

Bullous.—This type is an exaggerated form of the preceding. The lesions develop from primary vesicles in a gradual manner, or spring up more or less suddenly, reaching their full size in a day or two. The characteristic lesions are tense or flaccid blebs, varying from the size of a split pea to that of a small hen's egg. They often have a rounded form and outline, but more commonly present irregular shapes similar to those seen in the vesicular variety; the contained

fluid is a clear serum, which may become cloudy or opaque from semi-purulent changes. The bullæ are often very numerous, but are generally grouped in small clusters of two or three, and vesicles of various sizes may be found interspersed here and there, singly or in groups. Small pustules, either discrete or arranged in a segment of a circle, may likewise be closely associated with the more typical lesions. When the eruption is more or less profuse, or when the clusters are closely approximated, the adjacent skin becomes reddened and slightly puckered. The blebs may develop without signs of inflammation, but they are more often seated upon an erythematous base, and are sometimes formed by the coalescence of several closely set vesicles.

The distribution of the lesions is the same as that in the vesicular variety; any part of the cutaneous surface may be attacked, but the thighs, trunk, and arms are especially liable. The blebs have a distinct tendency to appear in crops, as in all varieties of the disease, and these may follow each other in such close succession that the intervening skin may assume inflammatory characters, with slight infiltration and even scaling. On the other hand, longer intervals may elapse between the outbreaks, which may be extensive or marked only by a few scattered bullæ or groups of vesicles. When ruptured by scratching, the lesions dry up with the formation of brownish crusts; these loosen in a few days and leave red spots which fade slowly, though pigmentation generally follows.

Itching and burning are bitterly complained of by patients exhibiting this type of the disease, but as a rule the general health is unimpaired. In severe and extensive outbreaks, however, more or less marked constitutional disturbance is often observed at first, but the symptoms rarely continue for any length of time. As in the other varieties of the disease, this type of lesion may change altogether during the subsequent course, but more especially in the relapses, when the erythematous multiform, or pustular type of lesion may be manifested.

Pustular.—While pustules are commonly enough encountered in the course of dermatitis herpetiformis, cases of the disease in which they are the exclusive lesions manifested are rarely if ever met with. They are almost always found associated with the lesions of some of the other types, especially with vesicles and bullæ, but often enough with vesico-papules and vesico-pustules.

When typical, the pustules are acuminate or rounded, and vary from the size of a pin's point to that of a small pea. They are usually tense and opaque, presenting a whitish aspect rather than a yellow color. The smaller lesions are, however, more or less flat, the larger

ones flattening in their course and displaying a tendency to spread peripherally, though not in the irregular manner that is usual in the vesicular and bullous types. Some of the recent, large pustules, but more particularly the older ones, as they spread peripherally, are surrounded by an inflamed areola. The pustules may arise as such, or they may be preceded by vesicles, vesico-papules, or blebs, in which case they are often seated on a raised inflammatory base. The lesions display a distinct inclination to appear in groups of two, three, or more, and several groups of this kind may be found bunched together. The arrangement of the pustules in the group sometimes produces a clinical picture not unlike a patch of herpes iris, in which a larger central pustule is closely surrounded by a number of smaller ones. As already mentioned, papules, vesico-papules, vesicles, vesico-pustules, and blebs may often be seen associated with the pustules just described.

The distribution of the eruption is the same as in the vesicular and bullous varieties, and the lesions likewise show a disposition to appear in crops. The development of the pustules is generally rather slow, one to two weeks being ordinarily required for them to attain full size, though in some cases they mature much more rapidly. A given attack may last three or four weeks, after which there may be an interval of quiescence of several weeks' duration, only to be followed by another outbreak perhaps severer than the first. In this manner, by repeated recurrence of the eruption at longer or shorter intervals—the outbreak sometimes being slight, at other times severe—the disease is often prolonged indefinitely. The recurrent attacks may not always conform to the pustular type of the disease, but the vesicular, bullous, or some other variety may be manifested at one time or another.

The itching is generally not so severe in this variety as in some of the others; burning and pricking sensations are also often complained of. The constitutional symptoms are generally more pronounced than in the other varieties, though they vary with the severity of the attack, being entirely absent in some of the mild cases. In no case does this type of the disease assume the severe and serious character that is peculiar to impetigo herpetiformis, and, as already stated, I do not consider the two diseases identical.

Multiform.—This phase of dermatitis herpetiformis is so frequently met with in the course of one or another of the varieties just described that a consideration of the clinical features characterizing it is of the greatest practical importance. It is, strictly speaking, not a distinct type, but represents more properly a transition stage of the process, marking the change from one type to another. The disease

rarely persists in this phase for any length of time, but it is extremely unusual to meet with a case of dermatitis herpetiformis in which the multiform eruption is not manifested at some period in its course.

The lesions characterizing the multiform variety are a mixture of those of all the other types, and consist of erythematous patches, urticarial wheals, maculo-papules, papules, vesico-papules, vesicles, bullæ, and pustules. The clinical picture produced is quite unlike that of any other affection of the skin, and is of great interest from a diagnostic point of view, for it often resembles eczema, erythema multiforme, urticaria, pemphigus, herpes zoster, etc. The lesions generally occur in groups or small aggregations, and may take the form in one place of erythematous patches or urticarial infiltrations of varying shape and size, while in another locality maculo-papules, papules, vesicles, or vesico-papules may be found variously mixed together or in close association with other erythematous lesions. Bullæ and pustules are sometimes observed among the other lesions, but they are never numerous and are generally small. The lesions appear in crops at varying intervals, and new efflorescences are often observed from day to day cropping out among the older lesions. When very numerous, or when the crops appear in rapid succession, an inflamed, eczematous appearance is imparted to the intervening skin. Sooner or later in the course of the disease excoriations and pigmentation occur. Itching and burning are always present as in the other varieties, and sometimes mild constitutional disturbance is experienced.

Etiology.

Nothing very definite is known in regard to the cause or causes of dermatitis herpetiformis. It occurs in both sexes and more commonly in females than in males. No age is exempt, though it is most frequently observed in young or middle-aged adults. It is not often seen in children; the youngest case I have met with was in a girl of seven years who, at the same time, was extensively affected with leucoderma. It may occur at any season of the year, and occupation and mode of living have no influence upon its production.

From the close resemblance dermatitis herpetiformis bears to pemphigus and other known dermatoneuroses in many features, and from its occurrence in some instances through a reflex irritation of the vasomotor centres, the probability of its being of neurotic origin seems most plausible. The association of the disease with leucoderma in the case just cited is interesting in this connection, and I have also observed a severe lupus erythematosus in a man of forty-five years affected with this disease. Many cases have been reported, moreover, following severe nervous shock or nervous exhaustion. Duh-

ring [17] records an interesting case of this kind in a man of thirty-four years, who, while gunning, accidentally stepped into a bog, into which he sank to the arm-pits. With difficulty and after long struggling he extricated himself, and was carried home in an exhausted condition. Three days later the eruption made its appearance and he suffered with it off and on for over four years. Elliot [18] reports two cases following severe mental emotion and shock. Cases of this kind have likewise been reported by Brocq, Crocker, Devergie, Gibert, Tenneson, and others. While mental emotion, worry, anxiety, etc., leading to nervous exhaustion, may be mentioned as contributing causes, it should be remembered that general depression and nerve exhaustion may result, in severe and protracted cases, from the intense and prolonged suffering. It is probable that in some cases the debility thus caused contributes to the further continuance of the disease. Winfield [19] reports four cases, all of nervous origin and in all of which glycosuria was an added symptom.

As examples of the disease occurring in a reflex manner may be mentioned the cases that develop during or after pregnancy, the *herpes gestationis* of Milton and Bulkley. When it occurs once it generally accompanies each succeeding pregnancy. It may begin at any period of gestation, and is sometimes the first indication the patient has of her condition; more frequently, however, it makes its first appearance a few days after delivery, and after a rather severe outbreak slowly disappears. Elliot, [20] in connection with a case of herpes gestationis, reports two others in which the climacteric was the direct exciting cause of the eruption.

Dermatitis herpetiformis in some instances also follows exposure to cold, and as other possible causes may be mentioned renal disease and septicæmia. There are many cases, however, in which no cause can be found, and very often the general health of the patients is unimpaired.

Pathology.

From the foregoing remarks it is apparent that our knowledge of the pathology of this disease is mainly theoretical, but we believe it is always a dermatoneurosis, resulting from disturbances of the nervous system by some means or other. The direct or indirect irritation of the vasomotor centres producing the cutaneous phenomena in a reflex manner is the probable pathology, but just what may cause this irritation is not quite apparent. Leredde and others, from recent experiments at the Saint Louis Hospital in Paris, are inclined to regard it as an auto-intoxication due to renal inadequacy. They found renal sclerosis, a nearly constant diminution of nitrogen in the urine, marked toxic properties of the liquid contents of the blebs, and

a great number of eosinophile cells in the blood and contents of the bullæ (Wickham).

Until further researches have been made in this direction, however, we can go no further than to state that the eruption is due to some functional or possibly organic derangement of the nervous system, the nature of which is unknown. This change must be a transitory one, whatever it may be, as the disease is characterized by periods of quiescence and as so many of the cases recover.

Morbid Anatomy.

Histological examination of the lesions of dermatitis herpetiformis has revealed nothing distinctive or pathognomonic of this disease. The changes are similar to those seen in lesions of the same character from pemphigus, herpes, eczema, erythema multiforme, urticaria, etc. Peripheral neuritis and nerve degenerations have been encountered in examination of the lesions, but these are not peculiar to dermatitis herpetiformis, and their relations as to cause and effect are likewise not yet definitely understood.

Diagnosis.

This may be difficult or easy according as the physician is guided solely by the lesions predominating at the time of observation, or takes a broader view of the case and considers the complex and multiform symptoms that make up the disease as a whole. A mistaken diagnosis is sure to follow a narrow conception of the clinical features, for at different periods in the disease the clinical picture may closely simulate that of pemphigus, erythema multiforme, eczema, urticaria, or herpes. The resemblance is so close in some instances that it is impossible to arrive at a correct diagnosis without taking into consideration the full history and the earlier and subsequent course of the disease.

Bearing in mind, however, certain distinctive features of the disease that are common to all cases, the diagnosis is comparatively easy. These are, the multiformity of the lesions with a tendency to change from one type to another, and a distinct inclination to grouping, together with evidences of the existence of former lesions in the shape of pigmented areas; the presence of intense itching, which is persistent and often out of all proportion to the amount of eruption present; the protracted course of the disease, which is marked by longer or shorter periods of quiescence or improvement; and finally, the extreme obstinacy of the affection under almost every form of treatment.

In *pemphigus* the lesions consist exclusively of blebs or bullæ,

which show no tendency to grouping, and which rise generally abruptly from the normal skin, thus lacking the inflammatory herpetic character of the bullæ in dermatitis herpetiformis. The blebs are also usually larger in pemphigus, and are rounded or flaccid, and are not irregularly angular or stellate in form; they are also much slower in disappearing than those in dermatitis herpetiformis. The groups of vesicles and small pustules that are almost always seen mingled with the lesions of the bullous form of dermatitis herpetiformis, are never observed in pemphigus. The symptom of itching will serve to distinguish the diseases in a large majority of instances, for it is generally absent or only slight in pemphigus, whereas in dermatitis herpetiformis it is often maddening.

Pemphigus pruriginosus is unquestionably a manifestation of dermatitis herpetiformis, and the attempts at differentiation by some authors we would accordingly consider superfluous. Finally, pemphigus is a much more serious affection, as a rule, than dermatitis herpetiformis, exhibiting severer constitutional symptoms throughout its course and terminating more often fatally. In *erythema multiforme* the lesions, though polymorphous, conform more to the macular and papular types than to the vesicular and bullous, and their localization on the backs of the hands, extensors of the forearms, dorsa of the feet, and fronts of the legs is a peculiar feature of the disease. The erythematous lesions are distinctly raised, and have a sharp definition, in contradistinction to the slight elevation and indefinite outlines of the erythematous patches in dermatitis herpetiformis. The color too is a peculiar dusky-red, and not a bright inflammatory redness as in dermatitis herpetiformis. The lesions of erythema bullosum develop on an erythematous base, but this is only exceptional in dermatitis herpetiformis, the bullæ often arising from the normal skin. Moreover, erythema multiforme is an acute disease, and runs a short course of a few days or weeks, often subsiding without treatment. Frequent exacerbations are uncommon, and the itching accompanying the eruption is rarely marked and is often absent.

Eczema is very closely simulated by dermatitis herpetiformis in nearly every case, and it is always necessary to take into consideration the complex of symptoms in the latter disease, in order to successfully differentiate the two affections. It is principally in vesicular and chronic papular eczema that difficulty is likely to be experienced, though there are many features that serve to distinguish them. The vesicles in eczema are generally smaller and more uniform in size than those in dermatitis herpetiformis, they are never irregular in outline, forming the stellate and angular lesions so characteristic of

the latter affection, they do not occur in groups which assume an herpetic character, and they tend to coalesce and rupture spontaneously. The papular lesions of eczema are likewise smaller and more uniform in size and shape than those of dermatitis herpetiformis, they develop more quickly, and show neither disposition to grouping nor tendency to appear in crops at irregular intervals, all of which features characterize dermatitis herpetiformis.

Certain cases of chronic papular eczema, especially in old people, develop bullæ late in the disease, and a likeness to dermatitis herpetiformis may sometimes be manifested, but the previous history of the case, together with other unmistakable symptoms of true eczema present at the time of observation, will always distinguish them. In a general way the severity of the process in dermatitis herpetiformis, the extensive distribution of the eruption, and its multiform character, its chronicity, with a tendency to repeated relapses, and finally, the obstinate resistance to every form of treatment, all serve to distinguish it from eczema. The itching and burning are also generally more persistent and more intense than in eczema.

In *urticaria* there is lack of symmetry in the lesions which, in the ordinary form are more raised than in dermatitis herpetiformis, and are not so irregular in shape. They moreover show no tendency to grouping or to the formation of circles or circinate forms. In urticaria bullosa the symmetry in the distribution of the lesions is likewise lacking, the blebs develop from a wheal, they are not angular or irregular in shape, and there is no disposition to grouping or circinate arrangement. The chronicity, the obstinacy, and the varying and ever-changing character of the eruption in dermatitis herpetiformis will always serve to distinguish it from urticaria.

Ordinary *herpes* is a simple, acute affair, and cannot very well be confounded with dermatitis herpetiformis; it is only with regard to *herpes zoster* that any confusion could possibly arise. While the lesions exhibited by the two affections are exactly similar in certain instances, the history and subsequent course in each case cannot fail to distinguish them. The antecedent neuralgic pains, the unilateral distribution along the course of some superficial nerve, the want of history of previous attacks of the same nature, and the short acute course, would sufficiently characterize herpes zoster.

Prognosis.

The majority of these cases are not very promising and it is therefore necessary to be guarded in giving a prognosis. Some types of the disease are less severe and serious than others, and much may be expected in a given attack from judicious and careful treatment;

promise of an eventual cure, however, cannot be given in any case. The form known as "herpes gestationis" gets well rapidly after parturition, but a recurrence at each subsequent pregnancy is to be expected. The purely erythematous type is also one of the less severe forms of the disease, but it is rare for the affection to conform exclusively to this type, and it must not be forgotten that it is liable to change at any time into one of the more severe varieties. The bullous and pustular varieties and the mixed type to which these often revert in the relapses, are the most severe and persistent forms of the disease, and though occasionally the attacks may become less frequent and severe, and finally cease altogether, this happy result is not to be expected.

The disease in all its forms is most obstinate and persistent, often lasting for years, and relapses at longer or shorter intervals not infrequently occur throughout the patient's life. A fatal termination is rare, however, and when death occurs it results generally from a complicating septicæmia; more often the patients succumb to some intercurrent disease in the severe and protracted cases. The majority of the patients go on for months or years with intervals of comparative comfort and freedom, and the general health is very little or not at all affected. The prognosis here given does not concern impetigo herpetiformis, which, as already mentioned, we regard as an independent disease.

Treatment.

Dermatitis herpetiformis is one of the most obstinate and rebellious of all skin affections; the most careful and judicious treatment, even in experienced hands, often proves disappointing, the patients going on, month after month, with little or no improvement in the condition of the eruption. This is no excuse, however, for our not devoting our best efforts in behalf of these sufferers, who vainly go from one physician to another with the hope of obtaining some permanent benefit. In a disease so inveterate and persistently chronic, little improvement or relief can be expected in a short period of time, but very many of the cases can be, and are benefited in the long run if the opportunity is given for careful observation and study of the patient, as well as of his disease. I say "study of the patient," for too often in this disease, as in many other skin affections, the attention of the physician is directed almost exclusively to the eruption upon the skin, with little or no regard for the condition, habits, and constitution of the subject.

The removal of the cause or causes is obviously of the first importance in the treatment of disease in general, but where the causes are

so numerous and diverse as they are in this affection, it is often quite impossible to arrive at correct conclusions in regard to them.

Very many of the cases, however, are due to some derangement of the nervous system, but whether functional or organic is not certainly known; nevertheless we observe in nearly every case nervous influences, such as anxiety, worry, mental depression, exhaustion, etc., which contribute to the continuance of the disease. Much benefit can be derived, therefore, from a proper guidance of the patient's mode of life, whereby these important contributing factors may be eliminated. Excesses of all kinds should be guarded against, and all exciting and enervating influences removed as far as possible; overwork of body and mind should be particularly avoided. Patients subjected to severe and continuous nervous strain from business worries and anxieties, or from those due to other influences, if circumstances will admit, often derive great benefit from a complete change of life and scene. The observance of healthful hygienic principles and out-of-door exercise and recreation, with a nutritious but non-stimulating diet, all contribute largely to the success of our therapeutic measures. Particular attention should be given to the condition of the digestive organs, and every deviation from normal functional health must be corrected as far as possible. As a general thing every form of alcoholic stimulant is harmful.

When we come to consider the therapeutic measures that are of service in this affection, it must be remarked at the outset that no definite and special line of treatment or class of remedies is applicable to all cases; there is likewise no specific for the disease. Some remedies are better suited to one type of eruption than to another, and in their consideration such special indications will be noted.

It may be said of the *internal* treatment that it exerts little or no influence upon the disease in very many of the cases, though occasionally much benefit may be derived from it. The drugs which are of most value are those that tend to restore nervous tone and vigor, and such general reconstructive tonics as individual cases seem to indicate. Iron, quinine, cod-liver oil, hypophosphites, and strychnine are all of service at one time or another in the course of the disease, and the alkaline diuretics, acetate and citrate of potash, often prove beneficial. Arsenic is the one drug above all others, however, from which we would expect the greatest benefit, from the analogy dermatitis herpetiformis bears to other neurotic affections, such as herpes zoster and pemphigus. While it may be truthfully said that such is really the case, its action more often proves disappointing than otherwise. In some cases, more particularly those of the vesicular and bullous types, arsenic does sometimes exert a control over the disease, but it must

be given in large doses even to the point of tolerance. It cannot be called a reliable remedy, however, for while it may do good in one case, in another, apparently exactly similar in all respects, no benefit is obtained, or even much harm may be done. It more often does harm than good in the erythematous and papular forms of the disease. The drug is best administered in the form of liquor sodii arseniatis, of which from two to five or even ten drops are given, well diluted, and in slowly increasing doses, every two or three hours.

When arsenic fails Crocker has succeeded in controlling the disease with full doses of tincture of belladonna, fifteen to thirty drops three times a day. Atropine has also been used with benefit.

External treatment is of very great importance in this disease, and much may be expected from it if a judicious and careful selection of the remedies is made. It may be said, in the first place, that most of the ordinary remedies employed with success in chronic eczema and other similar conditions are absolutely of no value in the treatment of this affection. My experience coincides with that of Duhring[21] who observed that the greatest benefit was generally derived from stimulating applications. Soothing remedies of all kinds are entirely ineffectual, though certain cases can bear only the mildest kind of soothing applications; these produce, however, no effect upon the disease.

It may be put down as a general rule that lotions are better borne, and are of more benefit than ointments; in the erythematous form of the disease ointments of any kind cannot be tolerated. The tarry preparations, and antipruritic remedies in general are the most reliable. Liquor picis alkalinus is one of the best, and should be used in the strength of a drachm to eight or twelve ounces of water. Liquor carbonis detergens in a rather strong solution, a drachm to four or six ounces of water, is also a very effectual remedy. These are both especially applicable to the erythematous type of the eruption. I have used ichthyol in from six- to ten-per-cent. strength in carron oil with gratifying results; it is often advantageous to saturate cloths with it and bind them on to the affected parts. In my experience less reliance can be placed upon thymol, menthol, carbolic acid, resorcin, and similar antipruritic remedies.

Ointments, especially those of tar and sulphur, are very effectual in the vesicular, bullous, and mixed forms of the disease. Unguentum picis et zinci is the most reliable of the tarry ointments, though an ointment of oil of cade, a drachm to the ounce, is sometimes serviceable. Sulphur ointment in strength of two drachms to the ounce is strongly recommended by Duhring. He especially directs that it should be rubbed in vigorously, so as to break the vesicles, bullæ,

and pustules, if benefit is to be derived from it. In a certain few cases this vigorous treatment with sulphur gives gratifying results, but in many instances it cannot be tolerated, and does much harm. It should never be employed in the erythematous form of the disease.

Alkaline and bran baths or baths of potassium sulphide may be employed with advantage in obstinate cases. A thirty-gallon bath with four ounces of potassium carbonate, three ounces of sodium carbonate, and two ounces of sodium biborate with a pound of starch, is grateful to many patients. They should remain in the bath about fifteen minutes, after which the body should be well anointed with vaseline.

POMPHOLYX.

Synonyms.—Cheiro-pompholyx (Hutchinson); Dysidrosis (Tilbury Fox).

The name dysidrosis, first applied to this affection by Tilbury Fox," of London, in 1873, has proved to be an unfortunate one, inasmuch as subsequent researches have demonstrated the fact that the affection is not dependent in any way upon a derangement of the sweat apparatus, as was formerly supposed. The affection commonly known as dysidrosis to-day is an entirely different disease from the one under consideration, and is intimately connected with the sweat secretion. The term is synonymous with "sudamina," an affection generally limited to the face, and described in connection with the diseases of the sweat glands. If we are to retain the term dysidrosis in dermatological nomenclature, its use should be limited to this sweat-gland disease, to avoid confusion; but we think the name "hidrocystoma" given by Robinson to this condition is a more appropriate one.

Definition.

Pompholyx is an inflammatory affection of the skin, characterized by the symmetrical development of deep-seated vesicles and bullæ upon the hands and feet, which occur singly or in groups, accompanied with burning, tingling, or itching sensations, and which disappear by absorption in from one to two weeks.

Symptoms.

Examples of what are probably mild cases of this affection are of common occurrence. The lesions generally develop along the sides of the fingers and borders of the palms in the form of small deep-seated vesicles which are rather few in numbers, and are accompanied with quite intense itching. They are usually associated with slight

the upper part of the rete, less often in the middle part, and only occasionally low down. They were often observed distinctly in the line of the sweat duct, and a sweat duct has been seen leaving the vesicle. They were therefore frequently situated in the interpapillary processes, though he admits that on the whole there were probably more vesicles over the papillæ, remote from the sweat-duct, than between them. Some proliferation of the sweat-duct cells was also found, but little or no inflammation of the sweat coil. Robinson," on the other hand, found the earliest vesicles nearer the top of the rete, and always over the papillæ, and therefore never connected with the sweat-ducts or glands.

When the vesicles are large, the fluid causes a degeneration and flattening of the cells of the rete, and in this way complete destruction of the rete may occur. In the upper part of the corium, extending into the papillæ and sometimes even into the rete, are found collections of round cells, rather densely aggregated in some places, especially in an advanced stage of the process. According to Robinson the sweat glands in the corium are always normal, and there is no connection between the sweat duct and vesicle in the rete, though in the corneous layer vesicles may form from retained sweat; this latter is an independent process due to the hyperidrosis. The fluid of the vesicles is neutral or alkaline in reaction, is clear at first, but becomes opaque later from contained pus corpuscles. Robinson claims that this is serum which contains a large amount of albumin and some fibrin, and that it comes from the papillary blood-vessels.

Diagnosis.

In making the diagnosis of pompholyx, we must remember that it is a comparatively rare affection, and occurs in nervous subjects, particularly in young women of a nervous temperament. Its distinguishing clinical features are the localization of the eruption on the hands and feet, the want of tendency to spontaneous rupture of the lesions, the dry red surface left after exfoliation of the epidermis, the short acute course, and the tendency to recur.

The disease is most liable to be mistaken for *vesicular eczema* in these localities, but it is not inflammatory, and the lesions do not rupture spontaneously leaving a weeping or crusted surface as in eczema. Moreover, in vesicular eczema the lesions extend beyond the areas usually affected with pompholyx. It sometimes resembles very closely *neurotic eczema* of the hands and fingers, the lesions of which are rather deep-seated early in their development, and are arranged in patches or groups. In neurotic eczema, however, the vesicles are not limited to the palmar surface of the hands and fingers,

but are often seen on their dorsal surfaces; there are always marked inflammatory symptoms; the patches become crusted and scaly from spontaneous rupture of the vesicles, and the patch spreads slowly by the formation of new vesicles at the periphery. All of these features are absent in pompholyx. A beginning *scabies* may slightly simulate this disease, but the rapid extension of the eruption and its subsequent course will soon remove all doubt.

Prognosis.

The disease generally disappears spontaneously in from one to two weeks, but severe cases may last a little longer. Recurrences are the rule, though they may be at long intervals; occasionally the attacks are frequently repeated at intervals of only a few weeks.

Treatment.

In the treatment of this disease every endeavor should be made to improve the general tone of the system, as the patients are almost always nervously depressed and generally out of health from their lowered nutrition. Any deviation from the normal functions should be looked for and corrected, and a nutritious but non-stimulating diet ordered. The use of tobacco, alcohol, tea, and coffee should be restricted, and the general hygienic surroundings improved as far as possible. A complete change of scene and mode of life would be advantageous in many cases, to avoid worries, excitement, business and other cares, etc. Tonics of iron, quinine, cod-liver oil, cinchona, strychnine, and hypophosphites are generally required, and aperient and diuretic mixtures are also of undoubted value. Arsenic is particularly effective in this disease, but it must be given to the physiological effect of the drug, and I would recommend it to be administered in the manner and form as already detailed for pemphigus. I have rarely failed to control the disease in a very few days by means of this remedy, and when pushed in the manner indicated a complete arrest of the process often results.

Local treatment is of much importance in relieving the tension and itching, but it does not affect the course and progress of the disease in any way. I have obtained the very best results from permanganate of potassium used in a one- or two-per-cent. watery solution, which should be applied two or three times a day. Calamine and zinc lotion should be sopped on after this has dried, or cloths may be wet with it and wrapped around the fingers or other affected parts. This treatment affords relief where many other applications fail in producing the desired effect. I have used a ten-per-cent. watery solution of ichthyol, followed by calamine and zinc lotion in this

same manner with most excellent results. Ointments such as Lassar's paste, oleate of zinc, a drachm to the ounce, and ichthyol in five- to ten-per-cent. strength, may also be employed, the best effect being produced by spreading them thickly on strips of lint, which are then wrapped around the parts. In all cases much relief is obtained by pricking the vesicles as soon as they develop.

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PUSTULAR AFFECTIONS.

BY

HENRY H. WHITEHOUSE,

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PUSTULAR AFFECTIONS.

WHILE the number of well-recognized diseases of the skin that may be secondarily inoculated with the agents of suppuration—the staphylococcus pyogenes aureus, albus, citreus, and streptococci—is extremely large, there are but comparatively few due primarily to the action of these agents, and that could, therefore, be properly included under the head of "Pustular Affections." Leloir,[1] in an article entitled "Des Pyodermites," has ingeniously termed the first group *hybrid pyodermias* and the second group *pure pyodermias.* Almost every known cutaneous disease may become secondarily infected with pyogenic cocci and would, therefore, at one time or another, be included under the term hybrid pyodermias. The diseases most frequently observed that may be thus inoculated are eczema, prurigo, urticaria, scabies, pediculosis, the various forms of tuberculosis of the skin, syphilis, and leprosy. The pure pyodermias, those affections due primarily to the infection with pus-producing cocci, would, on the other hand, comprise only the true pustular affections of the skin, which in the strict sense should include all superficial and deep inflammations produced primarily by pathogenic microbes.

In a work of this kind, however, comprehensive titles would obviously not be feasible, some of the diseases of a given class coming more properly under other heads. In this instance, therefore, some of the true pustular affections receive attention elsewhere, the reader being referred to the "Diseases of the Sebaceous Glands" for the various forms of acne, and to the "Phlegmonous and Ulcerative Affections" for such diseases as furunculosis and carbunculus.

Our studies in this place will be confined to the following affections: Impetigo, Impetigo simplex (Duhring), Impetigo contagiosa, Impetigo herpetiformis (Hebra), Ecthyma, and Sycosis.

IMPETIGO.

In the general acceptance of the term, impetigo is considered to be merely the temporary character of an eruption, commonly observed in connection with certain pruritic diseases, as eczema, scabies,

prurigo, etc., and due to an accidental infection with pyogenic cocci. It is not therefore a disease entity, as many unfamiliar with skin diseases are wont to suppose. Various forms of pustular eczema, impetigo contagiosa, the pustular lesions produced by parasites and by scratching, etc., were termed impetigo by the older writers, the name signifying to them a distinct pathological condition, or, in other words, an independent disease. Impetigo has no such significance to-day, these earlier views being no longer maintained, but it is regarded rather in the light of a clinical type of lesion, a clinical symptom, and if used without qualification is meaningless. Impetigo means a pustule, and nothing more; and it differs from a pustule of ecthyma or from a furuncle, only in the fact of its being more superficially situated.

If the term "pyodermia" referred to in our opening remarks, should ultimately gain general acceptance and should be adopted in dermatological nomenclature, it would include under the group "hybrid pyodermias" all those clinical variations due to secondary pus inoculation to which now the term impetigo is only applicable. The confusion which has arisen from the different interpretations of the meaning of this term would then no longer exist, as it would be reserved only for the generally recognized diseases, impetigo contagiosa and impetigo herpetiformis, and possibly for the affection next to be described, the existence of which is not yet universally acknowledged.

Impetigo Simplex (Duhring).

Definition.

Impetigo simplex is an acute inflammatory disease characterized by an eruption of a small number of hemispherical or semiglobular, tense pustules, which vary in size from a small split pea to a finger-nail, and which appear in a discrete manner chiefly upon the face and extremities.

Only two of the earlier writers defined an idiopathic impetigo corresponding to the impetigo simplex of Duhring. Bateman[1] in 1813 gave the name "impetigo sparsa" to a group of clinical symptoms practically identical with those of this disease, and Wilson[2] applied the term impetigo to a pustular affection in which the lesions developed primarily as discrete pustules and never from preceding papules or vesicles. All others designated various forms of pustular disease by this name, particularly those of an eczematous nature, reference to which has already been made. Duhring[3] was the first in this country to describe impetigo as an idiopathic disease, and though it

has since been recognized by various observers it has failed to receive very general acceptance. Bockhart,[3] however, pretty conclusively proved the existence of an idiopathic impetigo and he succeeded in reproducing it by experimental inoculation. He acknowledges at the same time the form of impetigo already described which develops by accidental inoculation in the course of certain pruritic affections. Unna[4] recognizes the impetigo of Bockhart but prefers to call it "impetigo staphylogenes." The idiopathic impetigo of both of these observers is identical with the one under discussion.

Symptoms.

The disease is generally unaccompanied by constitutional disturbance, though occasionally the eruption is preceded by general malaise, anorexia, and constipation; as a rule there are no febrile symptoms. The eruption is distinctly pustular from the beginning, the pustules appearing suddenly, a few at a time, but always arising as such and not from antecedent papules or vesicles. They appear in a discrete manner with no tendency to grouping and even when close together show no inclination to coalesce. They reach their full size, which varies from that of a small split pea to that of a finger-nail, in a very few days and often come out one after another for a period of one or two weeks. There are rarely over a dozen or two lesions present when the eruption is fully declared.

The pustules are round or ovoid in outline, somewhat elevated, and distinctly hemispherical or semiglobular in form; they are never acuminate or umbilicated. They are tense and firm and show no tendency to spontaneous rupture by reason of the thick, tough character of their walls. They are generally of a sulphur-yellow or yellowish-white color and opaque. When first formed they are surrounded by a red inflammatory areola which may be well marked or only faintly developed. The inflammatory symptoms usually lessen when the pustules attain their full size, but at no time is the infiltration at the base of the lesions a pronounced feature.

The distribution of the eruption is rather characteristic, the face and extremities generally being the only parts attacked. It may begin on the face, or the hands and fingers may be first affected, or the first lesions may be noticed on the feet. The hands and fingers are particularly liable to it, and it may sometimes invade the palms; the feet (including the soles), legs, and thighs may likewise be attacked. After reaching their full development the lesions remain stationary for a day or two, but often become darker in color, from the tendency of the contents to become bloody. They disappear in a few days by slow absorption of their contents, drying up into yellow or

brownish crusts; these are soon detached, leaving a reddened base from which the color gradually fades without pigmentation. If absorption is rapid and complete, the crusts are very thin; but if only a little of the fluid is absorbed, the lesions dry up with the formation of quite thick crusts. If the pustules are accidentally ruptured, the exuding fluid is quite thin and of a sero-purulent character.

The whole process is a superficial one, the eruption always disappearing without the formation of scars. The subjective symptoms are chiefly tenderness and soreness with little or slight itching or burning. The disease runs an acute course of a few weeks' duration, ending in complete recovery with little or no tendency to relapse.

Etiology.

Impetigo simplex rarely occurs in adults, but is observed chiefly in children from three to ten years of age irrespective of sex. When it does occur in adults it chiefly affects the hands and fingers. It is most frequently observed in apparently healthy subjects, though it occurs sometimes in poorly nourished children and in those living in bad hygienic surroundings. Duhring claims that the patients are always otherwise in good health. From the analogy the affection bears to other well-known conditions produced by pus infection, however, it seems reasonable to suppose that some underlying reduced state of the system, in some instances at least, predisposes the subjects to the action of the agents. The disease is not contagious. The direct cause of the affection has not been ascertained, but it is undoubtedly due to some specific micro-organism. Bockhart[1] succeeded in reproducing the disease by experimental inoculation. This observer believes that impetigo, furunculosis, and sycosis are only different forms of one and the same disease process; the same micro-organism, therefore, would probably be responsible for all three conditions.

Impetigo simplex may be regarded as one of the rarer diseases of the skin.

Pathology and Morbid Anatomy.

Nothing positive is known in regard to the pathology of the disease. The pustules are situated superficially in the corium and they begin as pustules and remain so throughout, rising abruptly from the surface in much the same way as the blebs in pemphigus; the entire thickness of the epidermis probably goes to form their outer walls. They are situated upon a non-inflammatory base and the process is a circumscribed one, but non-destructive, as there is never tendency to scar formation. The organized contents of the pustules

are epithelial cells, pus and red blood corpuscles, broken-down epithelial cells, and pus cocci.

Diagnosis.

Impetigo simplex is to be distinguished from pustular eczema, impetigo contagiosa, and the condition known as ecthyma.

In *eczema* the pustules are much smaller and more uniform in size, they do not develop discretely, but are closely aggregated and tend to coalesce, and they occur in much larger numbers. Papules and vesicles are generally to be found associated with the pustules of eczema, the walls of the pustules are also thinner and tend to rupture and discharge; and finally in eczema the lesions last longer, there is more or less inflammation and infiltration of the skin, and itching is a prominent symptom.

In *impetigo contagiosa* the lesions begin as vesicles or vesicopustules and not primarily as pustules; they are more superficial and have thin walls; they are flatter than the pustules of impetigo simplex; and are usually more or less umbilicated. The lesions of impetigo contagiosa, moreover, increase in size rapidly, and show a distinct inclination to coalesce into variously sized patches, which dry up into thin yellowish crusts, unlike the bulky crusts of impetigo simplex. Finally there is always a history of contagion which is wanting in impetigo simplex.

In *ecthyma*, so called, the pustules are flat, quite deep-seated, and are situated on a hard, inflammatory base with an extensive areola. The lesions also show hemorrhagic tendencies, and they dry into thick brownish or blackish crusts, which are large and flat and seated on deep excoriations. The pustules of impetigo simplex, on the other hand, are elevated and rounded, they are more superficially situated, there is only moderate induration at the base and only a slight areola, and they dry into yellowish crusts beneath which the skin is only slightly abraded. Finally ecthyma is most frequently observed in adults and usually in those broken down in health and cachectic, whereas impetigo simplex more commonly occurs in children who are often healthy in every other respect.

Prognosis.

The prognosis of impetigo simplex is always good, the disease running an acute course of a few weeks' duration and ending in complete recovery. There is no tendency to relapse.

Treatment.

The disease gets well spontaneously without treatment, but the soreness and discomfort can be greatly relieved by the employment

of suitable local measures. Much may be done in this way also to prevent the spread of the disease, and often its course may be greatly shortened. It is generally better to puncture the lesions and to empty them by gentle pressure before applying the remedies. Wet dressings of bichloride of mercury (1: 2,500), or of a saturated solution of boric acid, often stop the process of local infection in a short time; but oily preparations as a rule are more grateful to the patient, for they have a less drying effect. Ichthyol is generally a very efficacious remedy, the best effect being obtained from a six- to ten-per-cent. solution in carron oil. Cloths saturated with the oil should be wrapped round the parts and reapplied several times a day, or as often as they become dry. A five-per-cent. carbolized oil may be employed in the same manner, but it is less effective than ichthyol. Ointments are generally not well borne, but a five-per-cent. ammoniated mercury ointment often arrests the progress of the disease when other remedies fail; it should be applied twice daily. Ichthyol may also be used in the form of an ointment, preferably in zinc ointment in ten-per-cent. strength.

Impetigo Contagiosa.

Synonym.—Porrigo contagiosa.

Definition.

Impetigo contagiosa is an acute, inflammatory, and contagious disease of the skin, characterized by an eruption of a small number of superficial vesicles or vesico-papules, of a rounded, flattened, or oval shape and form, which develop discretely, and tend rapidly to become vesico-pustules with the formation of thin, yellowish crusts.

This affection was described as early as 1846 by Mr. Startin, of London, under the name of "porrigo contagiosa." This was practically the only remaining representative of the old group "porrigo," the different varieties of which were one after another identified with ringworm, favus, eczema, alopecia areata, etc.

Tilbury Fox' gave a separate and independent description of the disease in 1864 which he then designated "impetigo contagiosa," and it was through his writings then and subsequently that American dermatologists became familiar with the affection. It is now pretty generally recognized as a disease *sui generis*, though some of the leaders of the German and Austrian schools are still unwilling to acknowledge its claims to individuality.

The disease is of importance not only on account of this difference in opinion, and because there is some question in regard to its

true nature, but also from the fact that it is of very frequent occurrence, sometimes appearing even in an epidemic form, and that it often presents some difficulties in diagnosis.

Symptoms.

As a general thing there is no systemic disturbance, but its mode of onset varies in different countries, the eruption being preceded in some localities by constitutional symptoms of greater or less severity, while in others prodromal symptoms are entirely absent. In extensive and severe outbreaks, especially when it occurs in an epidemic form, there may be some slight febrile disturbance, general malaise, etc., but more commonly the eruption appears without previous warning. It consists in the development of a small number of vesicles or vesico-papules, which are flat or only slightly raised and at first are no larger than a pin's head. They increase in size rapidly, however, by extension at the periphery, and in this way blebs from the size of a split pea to that of a finger-nail are formed. Coincident with their growth they become decidedly flattened, often sinking in at the centre and presenting a more or less distinct umbilication.

The lesions appear a few at a time at intervals of a few days, or several crops may appear in rapid succession. At first they are disseminated, but closely contiguous lesions tend to coalesce, forming irregularly shaped patches of varying size. Isolated lesions are always to be found, however, in the neighborhood of the patches. The lesions are never very numerous, are very superficially situated, and are unaccompanied by areolæ. The eruption commonly begins upon the face, particularly around the mouth, and on the chin and nostrils, from which regions it may spread to the scalp and neck. When on the face the lesions generally coalesce into irregularly shaped patches. The fingers and hands are likewise often invaded and the eruption at times seems to appear simultaneously on the face and fingers. The disease is particularly liable to attack the ends of the fingers, often invading the entire circumference of a nail after the manner of a paronychia. In typical cases the trunk is not involved.

The lesions, in contradistinction to those of impetigo simplex, are nearly always vesicles or vesico-papules primarily, their contents being clear serum, but they tend rapidly to become vesico-pustules or pustules with cloudy or opaque contents. The duration of a lesion is but a few days or a week, and when involution begins the contents dry up rapidly with the formation of a thin yellow or greenish crust. These soon become detached around the edge, and as there is no inflammatory areola, the crusts present the appearance of being loosely "stuck on" to the healthy skin. These drop off in a few days, ex-

posing a smooth red patch which slowly fades, leaving no trace of the lesion's former presence. If a lesion is accidentally broken a moist, excoriated, red surface is left which continues to secrete a thin fluid.

The subjective symptoms are soreness, burning, or itching, any of which may be slight or absent. The lesions of impetigo contagiosa are auto-inoculable, and from day to day new vesicles crop out here and there, usually upon some excoriation from scratching, and as these take several days to pass through the stages of evolution and involution the disease may often be prolonged several weeks. Ordinarily recovery takes place spontaneously in from ten days to three weeks.

Variations.

Impetigo contagiosa is subject to great variation both in the severity and in the extent of the eruption. This is largely dependent upon the constitutional state and habits of the subjects attacked. In some cases the disease is a mere transitory affair, consisting only of two or three lesions about the mouth or on the nostrils, with perhaps one or two on the fingers. It takes but a few days for these to run their course, and if other lesions are not produced by auto-inoculation, the process ends there.

In other cases the lesions may be rapidly disseminated over the face, scalp, limbs, and trunk, through the process of auto-inoculation, in which case they may be distributed in a discrete manner, or coalescence may take place with the formation, here and there, of confluent lesions or large, irregular, crusted patches. In the more generalized form of the disease some of the lesions occasionally take on a more rapid and extended growth with the formation of bullæ even as large as a silver dollar. These may be tense or flaccid, and as they appear as a rule without distinct areolæ the condition often closely simulates pemphigus. This phase of the disease is chiefly observed in very young and poorly nourished children, and it then generally assumes an epidemic character. These cases are commonly reported as examples of epidemic pemphigus or "pemphigus acutus contagiosus neonatorum." Adults may also acquire the disease from contact with children suffering from this form of the disease (see *Pemphigus*).

Isolated examples of this severe type of eruption are sometimes seen, a remarkable instance of which has been reported recently by Elliot[1] as "an unusual and exaggerated case of impetigo contagiosa bullosa." This occurred in a poorly nourished boy of eight years, and the eruption was generally distributed over the trunk, limbs, face, and scalp. In addition to the ordinary form of small,

discrete, crusted patches interspersed with primary efflorescences in various stages of development, there were large, denuded, partially crusted areas with polycyclic and serpiginous borders which were composed of crusts, bullæ the size of peas, and flaccid bullous elevations due to the undermining of the epidermis with fluid. Some patches the size of a silver dollar were encircled by a continuous bullous wall a quarter of an inch broad; both palms were diffusely affected by patches of this character, the borders of which were composed of bullous elevations and crusts.

It sometimes happens that a variation from the usual type of lesion is observed which is dependent upon the locality affected and the extraneous influences to which the eruption is subjected in consequence. When the lesions appear upon the lower legs, for example, they are often ruptured by the friction and rubbing to which they are necessarily exposed, with the production of inflammatory, scabbed, and indurated lesions of an ecthymatous character. It is rarely, however that the eruption is limited to these regions, and other lesions of a more typical aspect can generally be found elsewhere.

In some cases, also, the primary lesion of the disease is a pustule, like that of simple impetigo, the ordinary antecedent vesicular stage never being observed; but this is a very rare occurrence. Crocker states that he has seen the eruption in adults in the form of red, raised, irregular, and irritable papules, none of them being distinctly vesicular or pustular. Finally, in addition to the usual eruption upon the skin, lesions of the same character have been exceptionally observed upon the mucous membranes of the nose and mouth and also upon the conjunctivæ. Occasionally there is also swelling of the submaxillary glands.

Etiology.

Impetigo contagiosa is most commonly observed in infants and young children, of ages varying from one to twelve years. It seldom occurs in adults, but when it does it generally runs a very mild course and lasts but a few days. It occurs chiefly in the families of the poor where the children are badly fed and ill cared for, though it is sometimes seen in the higher walks of life. The disease is contagious and has been frequently observed to run through a school or institution in a pseudo-epidemic form. The lesions are inoculable and autoinoculable. It is not uncommon to see a mother or nurse infected on the arm through carrying an infant suffering from the disease, and in the same manner lesions may develop on the neck and breast from contact with the lesions of contagious impetigo on the infant's face.

The disease is always due to inoculation with pyogenic cocci from one source or another. Pediculi capitis are commonly spoken of as a cause of the disease and it has been frequently observed to follow vaccination. The majority of cases of pediculi capitis are sooner or later secondarily infected with pus cocci through the act of scratching, but only exceptionally do the auto-inoculated lesions assume the characters of impetigo contagiosa. The same may be said of the auto-inoculated lesions that sometimes arise from an infected vaccine vesicle. These conditions, therefore, can be considered only as sources of the pus, which operates in the production of the lesions of impetigo contagiosa. The distinctive and specific character of these lesions is undoubtedly dependent upon some underlying systemic state rendering the subject peculiarly vulnerable.

Pathology.

The most natural supposition in view of the contagiousness of the affection would be that it is parasitic in nature. Efforts have accordingly been made to discover in the crusts and in the fluid contents of the lesions the *materies morbi* of the process. Kaposi[9] found a fungus in the epidermic cells of the vesicle walls, and he accordingly named the affection "impetigo parasitaria." His results, however, have not been confirmed. Geber[10] and Lang[11] regard the disease as a vesicular form of ringworm, with which opinion Kaposi and most other authorities agree in so far as relates to the cases they observed which were complicated with the latter disease. Crocker[12] found chains of micrococci in the fluid from unruptured vesicles and pustules, and pure cultures have been made of staphylococci found in the same manner by various investigators, but inoculation experiments have failed to reproduce the disease. Vesicles and pustules have resulted from such inoculation, but they heal quickly and disappear without developing further characters of the disease. It is nevertheless highly probable that the affection is due to a micro-organism and possibly to the staphylococcus aureus itself. The infection undoubtedly enters the epidermis from without.

Some hold that impetigo contagiosa is an acute infectious disease, from the occasional presence of febrile symptoms, the occurrence of the affection in childhood and often in an epidemic manner, and the occasional swelling of the submaxillary glands.

Diagnosis.

The characteristic features of impetigo contagiosa are the discrete arrangement of the lesions, which are primarily vesicles or vesico pustules; the absence of a distinct areola, except when the lesions are

irritated; the inoculability and auto-inoculability of the fluid contents; and the decided inclination of the disease to spread by contagion.

It is to be distinguished from pustular eczema, impetigo simplex, scabies, ecthyma, herpes iris, urticaria bullosa, varicella, and pemphigus.

Pustular eczema, especially as it occurs upon the face in children, may be mistaken for this disease, for the lesions of impetigo contagiosa in this locality tend to coalesce into irregularly-shaped, crusted patches. There can usually be found, however, in the neighborhood of a patch of impetigo contagiosa, discrete vesicles or vesico-pustules which are of large size and show no tendency to spontaneous rupture, as do the pustules of eczema. The accompanying inflammation and thickening of the skin of the affected area, together with the intense itching that is experienced, would always distinguish an eczema. Moreover, after the removal of the pustular element by proper treatment a true eczematous patch remains.

In *impetigo simplex* the lesions are pustules from the beginning and are more deeply situated than in impetigo contagiosa. Their walls are also thicker and they are elevated and rounded, showing no inclination to flatten or to become umbilicated. They show no tendency to increase rapidly in size and to form patches by coalescence, and the resulting crusts are thicker and more bulky than in impetigo contagiosa. History of contagion is also wanting. The rare cases of impetigo contagiosa in which the primary lesion is a pustule are difficult to distinguish clinically from simple impetigo, the chief reliance being placed upon the history and course of the affection.

Scabies in children often simulates this disease very closely, but the lesions usually begin on the hands or body and are rarely seen upon the face. They are multiform in character—papules, vesicles, and pustules—they occur in larger numbers and are smaller than the lesions of impetigo contagiosa, and often display a slight tendency to grouping. The furrows produced by the burrowing of the itch mite can usually be demonstrated, though sometimes only after the most diligent search, and the itching accompanying the eruption is generally intense. Moreover, scabies runs a longer course than impetigo contagiosa and is never preceded by febrile or constitutional disturbance.

In *ecthyma* so-called, the lesions are deep-seated, and are associated with inflammatory induration—the redness extending beyond in the form of a distinct areola. They are never situated upon the face or hands, but are usually confined to the lower legs, and they always occur in adults. Ecthymatous lesions may develop in the course of

impetigo contagiosa in children, as already mentioned, but other characteristic lesions of the disease will be found elsewhere.

Some of the lesions in the bullous form of impetigo contagiosa may resemble *herpes iris*, but their distribution and multiplicity will distinguish them; and in herpes iris there is no tendency to auto-inoculation and implantation here and there of other lesions by scratching.

In *bullous urticaria*, a form of the disease frequently observed in children, the blebs develop from an antecedent wheal or papule, and other lesions not thus complicated are likewise present. The eruption, moreover, shows no tendency to special localization and is always accompanied by violent itching.

In *varicella* the lesions are disseminated and show no tendency to coalesce with the formation of crusted patches, and they are smaller and more uniform in size. The features characterizing the general course of the disease would also be wanting in impetigo contagiosa.

Pemphigus, in both the acute and chronic form, may be simulated very closely by impetigo contagiosa. Pemphigus vulgaris, however, as it usually occurs, runs an insidious and chronic course. The bullæ also develop in successive crops, and though they rise abruptly from the normal skin they are of good size from the beginning and not small at first like those of impetigo contagiosa. The bullæ in pemphigus, moreover, enlarge by their own growth or by coalescence with other lesions, but they never increase in size by a progressive evolution at the periphery with a central flattening or umbilication that is so characteristic of impetigo contagiosa. The lesions of pemphigus show no disposition to appear in special localities, the bullous contents are not auto-inoculable, and the disease is accompanied by grave constitutional disturbance.

It is with acute pemphigus vulgaris, which is distinctly a disease of infancy and early childhood, that impetigo contagiosa is most liable to be confounded. The lesions in this disease, however, arise from an inflammatory base and do not enlarge by peripheral extension as in impetigo contagiosa. Moreover, acute pemphigus is a serious and often fatal disease, the lesions, which appear in successive outbreaks, being accompanied by high fever, general prostration, and other severe constitutional symptoms; a complicating albuminuria is likewise not uncommon. It must always be remembered that pemphigus is an extremely rare disease, and this is particularly true of acute pemphigus in children.

Prognosis.

The prognosis of impetigo contagiosa is always favorable, the disease ordinarily disappearing spontaneously in from ten days to

three weeks. It may last for a much longer time, however, if scratching is indulged in to any extent, for the pus is then implanted here and there over the body and new lesions develop by inoculation upon excoriations thus produced. In this way the eruption may be made to last several months. The disease responds very quickly to treatment.

Treatment.

Treatment should be begun as soon as possible, not only to prevent the further spread of the eruption and to cut short its course for the comfort and benefit of the patient, but to insure protection to others who may at the time be exposed to infection. Fortunately the treatment is simple and very effective. The crusts should be soaked off with sweet oil or by washing with white castile soap and warm water, after which an ointment of ammoniated mercury ten grains to the ounce should be rubbed in two or three times a day. Three or four per cent. of ichthyol in zinc ointment is also effectual, especially when the crusts are adherent, in which case it should be spread thickly on lint and bound on. Beta-naphthol, half a drachm to the ounce, is likewise a useful application. In all cases, but particularly in the bullous form of the disease, ichthyol in three- or four-per-cent. strength in carron oil is very effective. Bandages or cloths should be soaked in the oil and wrapped round or laid upon the affected parts. These should be again saturated and reapplied as often as they become dry.

One or another of these forms of treatment will stop the progress of the disease in a simple case and heal the lesions in a few days, but the bullous type of the eruption is generally more rebellious, requiring a longer time to obtain a cure. It is important in all cases to enjoin cleanliness, and cod-liver oil, iron, and general tonics are to be recommended, for the disease invariably occurs in those who are poorly nourished and generally out of health. Arsenic, even in the distinctly vesicular and bullous cases, is entirely without effect.

Impetigo Herpetiformis (Hebra).

Definition.

Impetigo herpetiformis is a rare inflammatory disease of the skin, characterized by the development upon special regions, of groups of small pustules, occurring chiefly in pregnant women, attended with severe constitutional symptoms, and terminating as a rule fatally.

This disease, with the exception of its being a distinctly pustular affection, bears no relation or resemblance to the preceding varieties

of impetigo, but is analogous, rather, in most respects to either pemphigus or dermatitis herpetiformis. It resembles this latter affection so closely as regards its clinical symptoms and general course that Duhring formerly regarded it as a pustular variety of his dermatitis herpetiformis. It is now, however, generally considered to be an independent disease, though it is very little understood in consequence of its extreme rarity.

Our knowledge of the affection has been derived chiefly from the writings of Hebra and Kaposi, and to these observers belong about three-quarters of all the authentic cases that have been reported. The affection was first described and named by Hebra [15] in 1872, who reported five cases all in pregnant or parturient women, four of whom died in the first attack and the fifth died a short time after in the course of a relapse. Five years previous to this time, however, Baerensprung [16] described a case of what he called "herpes circinatus," but which Hebra subsequently said was a case of impetigo herpetiformis. Auspitz,[16] in 1869, also reported two cases under the name "herpes vegetans;" one of these was one of the five subsequently described by Hebra, the other was in a pregnant woman and this likewise terminated fatally. In regard to these two cases of Auspitz some doubt has been expressed as to the diagnosis. They are considered by many as examples of pemphigus vegetans (see *Pemphigus Vegetans*).

Kaposi,[16] in an interesting article on the subject, in connection with which he recorded the case of a young man of twenty who died in four or five weeks of the disease, stated that seven new cases had been observed in his Vienna clinic up to that time, making a total of thirteen. All were in pregnant or parturient women with the exception of the case just mentioned, and all ended fatally. In Kaposi's last treatise [17] he states that fifteen cases had been observed in the clinic up to that time, but from a statement which follows I should conclude that these were exclusive of the male case just mentioned. Dubreuilh,[18] in a critical and exhaustive article, records a second male case, aged fifty-three years, which ended fatally; and Brier [19] also reports an additional case with a lethal outcome in a pregnant woman of twenty-three years.

Other cases have been reported from time to time, but in nearly every instance some question has been raised in regard to the diagnosis. Among these may be mentioned a case of Heitzmann's,[20] in a non-pregnant woman of fifty-two at the time of the climacteric; one of Pataky,[21] an assistant to Geber, in a young man of eighteen years; one of Schwartz,[22] in a non-pregnant woman; and one of Zeisler.[23] These have been regarded as examples of either pemphigus or herpes,

and a fatal pemphigus developed in both Heitzmann's and Schwartz's cases. Others have been recorded which have been thought to be instances of dermatitis herpetiformis. These were by Maret,[14] du Mesnil and Marx,[15] and Sherwell.[16] Schulze[17] also gives a case which is somewhat questionable. Finally Hallopeau[18] depicts an anomalous pustular eruption in a man of fifty which bears a very close resemblance to impetigo herpetiformis.

It will be seen, therefore, that we have to deal with an extremely rare affection, as there are certainly not more than twenty authentic cases on record. Although the writer has not seen any of the cases reported by Kaposi, he has recently had a patient under his care in whom the diagnosis of impetigo herpetiformis was confirmed by others who had seen some of the Vienna cases. This was in a man of forty years and it likewise terminated fatally. The notes of this case are as yet unpublished, but it will shortly be put on record as the third instance of the disease occurring in a male subject.

Symptoms.

The eruption consists of small miliary or pinhead-sized pustules, which are very superficially situated upon a swollen inflamed base, and are surrounded by a well-pronounced red raised areola. The contents of the lesions are pustular from the beginning, and they are yellow and opaque at first but later are of a greenish-yellow color. They may develop in an isolated manner but are usually closely situated, forming more or less circular groups of from a half to one inch in diameter. The pustules dry up in a few days with the formation of brownish crusts, but new ones speedily spring up around the periphery, producing in this way a rounded patch with dried, dirty-looking crusts in the centre, surrounded by one or more rows of small pustules. As these latter dry up the central crust becomes larger in consequence, and by the continuous development of new lesions at the periphery the patch enlarges in a serpiginous manner. Coalescence with similar groups or patches takes place, whereby more or less extended areas of the surface are implicated in a relatively short period. However extensive the area involved, the tiny pustules surrounded by a red zone, that are so characteristic of the disease, are always to be seen cropping out here and there along the border.

When the crusts become detached, the underlying surface is red, smooth, and dry, and is composed of a very thin new epidermis which continues to exfoliate for a short time. This may extend over the whole area covered by the crusts, but more usually there are places that have failed to form new epidermis and that remain red

and excoriated, with some infiltration and considerable weeping, as in eczema. In the writer's case already mentioned, fresh crops of pustules were not only seen to develop around the periphery of the patches, contributing to their growth and extension over the surface, but they were repeatedly observed to form upon the new, thin, and very red skin that had been previously invaded, almost as soon as the crusts were detached. This healing and formation of new epidermis does not take place where two opposing surfaces of affected skin come together, as in the groins, perineum, abdominal fold, axillæ, beneath the pendulent breasts, etc., but the surfaces remain raw and excoriated and are covered with dirty thick crusts. There is never ulceration, however, for the process always remains a superficial one, and healing takes place without scar formation.

The special regions first attacked by the disease are the genito-crural folds and inner side of the thighs, around the navel, beneath the breasts, in the axillæ, and on the oral and buccal mucous membranes. The eruption rapidly extends, however, by the frequently repeated outbreaks of new crops of pustules, so that the entire surface of the body may be involved in three or four months. The skin then becomes swollen and hot, is covered with crusts, and presents fissured and excoriated surfaces which are bordered by rows or circles of small pustules. The face, scalp, palms, and soles all share in the general process, and the decomposing crusts and secretions emit a peculiarly fetid and nauseous odor. In my case the process was particularly severe about the nails, the pustules developing continuously around the edges of them, and pus could be pressed out from beneath them. One great toe-nail and several of the finger-nails were gradually loosened in this way and finally thrown off.

The *mucous membranes* are generally also involved and the process is very similar to that seen upon the skin. The eruption, in fact, sometimes makes its first appearance in the mouth, and this often long before it shows itself upon the cutaneous surface. The lips may be covered with dirty brownish crusts, which are frequently detached accidentally, leaving exposed bleeding, excoriated patches. On the tongue, inner side of the cheeks, the palate, and the posterior pharyngeal wall, are irregularly shaped but circumscribed patches of a grayish color; and in one of Kaposi's cases there were found upon autopsy groups of pustules and little ulcers upon the folds of the œsophagus. When the lips and cavity of the mouth are affected in this manner, eating becomes almost impossible from the severe pain it occasions, and there emanates a most offensive odor from the decomposing fragments of membrane. Other mucous membranes may likewise be involved, particularly the nasal, conjunctival, and vulvovaginal.

In addition to the clinical features above described, complicating lesions or eruptions have been observed to appear in the course of an otherwise typical case of impetigo herpetiformis in a few instances. These, however, are very unusual manifestations, and in most of the cases in which they occurred they have led to doubts as to the correctness of the diagnosis. Flat vegetations, for example, have been seen to develop upon excoriated surfaces, particularly where two portions of skin oppose each other, and these present very much the appearance seen in pemphigus vegetans. In like manner bullæ have been known to develop late in the disease and the patient would die from all appearances of a pemphigus. Heitzmann's and Schwartz's cases were of this nature. Erythema urticatum was also associated with the pustules in one of Kaposi's cases, and hemorrhagic vesicles grouped like a herpes iris were observed in Pataky's case.

The *course* of the disease, while it is marked by shorter or longer periods of quiescence or even slight improvement, is generally progressive. New crops of pustules appear from time to time, either in localities not previously attacked or around the borders of existing patches, thus contributing to their progressive growth and spread.

Each fresh outbreak of the eruption is preceded by marked rigors and a high fever, but the temperature soon falls and the general symptoms of a severe remittent fever are manifested. The tongue and lips become dry and hot, the bowels are loose, thirst is pronounced, there are intercurrent rigors, anorexia, vomiting, and marked prostration. The urine is generally high-colored and of a high specific gravity, with an increase in the amount of urea, and albumin is usually present in the later stages of the disease. Certain nervous symptoms have also been observed, as a low muttering delirium, muscular twitchings, and even distinct convulsions. The patients complain of burning pain, soreness and tension in the affected skin, but itching is not a marked feature except in the early stages of the disease. The lesions in the mouth and on the tongue cause most intense pain, and towards the end the patient is in a condition of extreme misery.

The *duration* of the affection depends upon the general constitution of the patient and the severity of the outbreaks. Some succumb in a very few weeks, while others go on for five or six months or even longer. The majority of the cases have terminated fatally in a few months. They may recover, however, from the first attack, but the disease is liable to recur, in which case death has generally followed in the second or third attack.

Etiology.

Very little of certainty is known in regard to the cause or causes of the affection. All but two of the recorded cases occurred in women, and the entire fifteen that Kaposi mentions as being observed in his clinic in Vienna were in pregnant women. It was therefore naturally considered to be a reflex neurosis, like herpes gestationis (a manifestation of dermatitis herpetiformis associated with pregnancy) and other dermatoses dependent upon uterine conditions, as some varieties of pemphigus and erythema multiforme. Unlike herpes gestationis, however, delivery in no case affected the course of the disease one way or the other. The occurrence of two male cases, one of Kaposi's and the other of Dubreuilh's, would nevertheless preclude the idea of the impregnated uterus or any other uterine condition being an exclusive etiological factor.

It is possible that the disease is septic in origin, and Neumann regards it as a metastatic pustulosis, hence his name "herpes pyæmicus seu puerperalis." In only one of the fifteen cases, however, were there found upon autopsy endometritis and peritonitis. In the young man observed by Kaposi the disease began as a severe intertrigo with grave general symptoms, and there were found post mortem a tuberculosis of the peritoneum and chronic pachymeningitis with serous infiltration of the brain. The theory that it is an infectious disease and due to some specific micro-organism is plausible in view of the severe constitutional symptoms, high fever, and fatal course, but investigations in this line have been unfruitful. Only the ordinary cocci of suppuration, bacteria, and vibriones have been discovered in the pustular contents, and these are obviously of no significance, as the same are found in all suppurating conditions and even in the normal epidermis.

Pathology and Morbid Anatomy.

We are about as much in the dark with regard to the pathology of the disease as we are with respect to its etiology. Aside from the post-mortem findings just mentioned nothing has been observed to afford an explanation of the great fatality in these cases. The theory of its being a septic condition seems most likely, but as yet we have no tangible proof of this. Microscopical examination of skin sections has revealed nothing of interest or practical value. The pustules are situated very superficially in the epidermis, and there has been found a dilatation of the blood-vessels and lymph spaces with swelling of their lining cells, also a round-cell infiltration in the

upper part of the corium and a down-growth of the interpapillary processes.

Diagnosis.

The main diagnostic features are the occurrence, chiefly in pregnant women, of an eruption composed of small superficial pustules which develop in successive crops with a tendency to grouping and peripheral extension, while they dry into crusts at the centre; the tendency to special localization at first, and implication of the oral mucous membrane; the accompanying systemic disturbance with rigors and high fever, and the almost certain fatal ending.

The diseases most likely to be mistaken for this affection are dermatitis herpetiformis, pemphigus, and syphilis.

In *dermatitis herpetiformis* the lesions develop in crops which tend to group and spread peripherally, but they are multiform—papules, vesicles, bullæ, erythematous patches, etc., and pustules are only an exceptional occurrence. There is also more or less erythema present and the eruption is always accompanied by severe itching. The disease, moreover, is of a much milder character and rarely terminates fatally. These same features characterize its variety, herpes gestationis, which is associated with pregnancy; but in these cases delivery generally puts an end to the process, whereas in impetigo herpetiformis it exerts no influence upon the progress of the disease.

Pemphigus as it ordinarily occurs should not be mistaken for impetigo herpetiformis, though the general course, character, and termination of the two affections are much the same. Where bullæ are the chief lesions exhibited, the diagnosis of pemphigus would be justifiable; but when the disease begins with groups of small pustules, and conforms more or less to this type of lesion throughout its course, the diagnosis of impetigo herpetiformis may be made. It must be remembered that bullæ rarely occur in impetigo herpetiformis, and in the cases where they have been observed the disease ran the typical pustular course for a long period before blebs were manifested. It is therefore necessary to study the cases closely for a long time before making a diagnosis.

The affection is more liable to be confounded with pemphigus vegetans than with any other form of pemphigus, for this variety almost invariably begins in the mouth and the mucous membrane presents the same appearances as in impetigo herpetiformis. The vegetations that have been observed are also the same in both affections, but sooner or later bullæ are found associated with the other cutaneous lesions, and if these are of fairly constant occurrence the diagnosis of pemphigus can be made. In all cases a most

important diagnostic point would be the fact that impetigo herpetiformis has been observed, with one or two exceptions, only in pregnant women.

Syphilis never conforms to a distinctly pustular type of lesion for long, and ulcerations, gummatous deposits, and evidence of the existence of former lesions will be observed sooner or later. Moreover, the previous history of the disease, the absence of grave constitutional symptoms, and the improvement under antisyphilitic treatment would establish the diagnosis.

Prognosis.

The prognosis in these cases is extremely grave, for the disease has proved fatal in nearly every instance. Thirteen of the fifteen cases reported by Kaposi died; two apparently recovered permanently. Death generally occurs in a few weeks or months, or if recovery takes place the disease returns at a subsequent pregnancy and the patient dies in the second or third attack. Delivery, as already mentioned, does not influence the progress or ultimate course of the disease, and the pregnancy is generally terminated before the full term.

Treatment.

Treatment has thus far been ineffectual. All the remedies that have been given internally or applied to the surface have failed to control the disease or to alter its general course and termination. Arsenic does harm in every instance, and the general treatment consists in merely relieving the symptoms as they arise, and in the administration of general tonics together with a supporting dietary. Quinine in full doses has also been recommended. Hyposulphite of sodium in ten- or fifteen-grain doses three times a day did seem to lessen the pustular outbreaks in the case under my care, and the rigors and general symptoms were less pronounced during its administration.

The *local* remedies that are generally effective in pustular conditions are entirely inert in this disease, though the applications suggested for pemphigus foliaceus are worthy of trial. Ichthyol is probably the most serviceable remedy and some relief is obtained from the application of bandages soaked in a six-per-cent. solution of it in carron oil. When the disease becomes generalized creolin baths may be grateful, and the continuous system of baths recommended for pemphigus would undoubtedly prove beneficial, though they are difficult of administration.

ECTHYMA.

All that has been said on a previous page while discussing the subject of impetigo would apply, in a great measure, to ecthyma (from Gr. ἔκθυμα, a pustule), for the two processes differ only in degree and not in kind. The pustule of impetigo and that of ecthyma are undoubtedly due to the same pathogenic microbes, the differences in their clinical symptoms being dependent upon intrinsic or extraneous influences. In the one case the infection is superficial, the pustule developing in the uppermost layers of the epidermis, while in the other the virus penetrates more deeply, the morbid process invading the entire thickness of the epidermis as well as the upper part of the corium.

Ecthyma, therefore, is not a distinct and independent disease any more than is impetigo, though some authorities still regard it as such. There are certain predisposing factors, nevertheless, that are necessary for the development of the so-called ecthyma pustule that are not operative in the production of the pustule of impetigo. These are subjoined or added features that stamp upon the ecthymatous lesion peculiar and distinctive characters that are seen in no other form of skin eruption. The ecthyma pustule therefore stands alone as a special clinical type of lesion, and its course and etiological relations are sufficiently well defined to demand a separate study and description.

Clinical Course.

There is nothing peculiar in the lesion of ecthyma in its early stages. It begins primarily as a pustule, developing in a few days from a minute erythematous spot which marks the site of inoculation. In the absence of a prepapular or prevesicular stage, its mode of development corresponds to that characterizing lesions of impetigo simplex and impetigo herpetiformis. The pustule is at first rounded and of a yellowish color, but from its tendency to become hemorrhagic soon changes to a reddish-brown shade. When fully formed it is about the size of a small split pea. It generally takes four or five days to attain this size and it is then surrounded by a red inflammatory halo, and its base becomes slightly infiltrated. The lesion continues to enlarge slowly until at the end of a week or ten days it is from a half-inch to an inch in diameter. Coincident with the growth a flattening of the lesion takes place and a crust begins to form at the centre. It has now become more intensely inflammatory in character and its base is considerably infiltrated, the induration extending

quite deeply into the tissues. An angry-looking red areola extends for a variable distance beyond the pustular border.

After remaining in this condition for a few days, involution generally takes place. The inflammation subsides slowly, the whole lesion dries up with the formation of a dirty brown or blackish crust, and when this separates a reddish-brown pigmentation remains which is very slow in disappearing. In some instances the pigmentation is more or less permanent. The duration of an individual pustule is from two to three weeks, though some mature more rapidly and run their course in a much shorter time.

As a rule ulceration does not take place and the lesion disappears without the formation of a scar, but in cachectic and broken-down subjects the process often assumes a more aggravated form. In these cases, instead of involuting in the manner just described, the lesion continues to extend until it becomes quite enormous in size, and ulceration then takes place beneath the crust which is greatly thickened. Life may be endangered from the tendency of the ulceration to take on phagedenic characters with the production of more or less extensive gangrene. The lesions of ecthyma generally appear in a discrete manner and are never very numerous, there rarely being more than ten or a dozen present at any one time and often only two or three. New pustules develop, however, at intervals of days or weeks—their contents being auto-inoculable, and in this manner the process may be kept up for several months or indefinitely. The lower limbs are the localities usually attacked, but the lesions may develop on the shoulders or any other part of the body by implantation of the virus with the nails in scratching. The subjective symptoms are never a prominent feature and usually consist of slight tenderness or burning pain. Itching, if present, is generally of a mild character.

Etiology.

The lesions of ecthyma are observed only in extremely debilitated subjects, more particularly those reduced to the lowest ebb through chronic alcoholism, excesses, debauchery of all kinds, cachexia, etc. Improper and insufficient food associated with filth, squalor, and destitution are powerful predisposing factors. The condition is, therefore, most frequently observed in the common vagrant or tramp, and in the inmates of almshouses, prisons, and jails. It is rarely seen in children. It sometimes develops in the course of such diseases as syphilis, variola, glanders, diabetes, and nephritis, and these under certain conditions may therefore be regarded as predisposing causes.

The prime exciting factor in the production of the lesion is undoubtedly a micro-organism, and in all probability the staphylo-

coccus pyogenes albus, aureus, or citreus. The lesions are inoculable and auto-inoculable, and can therefore be transplanted here and there over the individual or can be conveyed to another likewise predisposed by immediate or mediate contact. Auto-inoculated lesions undoubtedly develop upon abrasions resulting from the bites of fleas, bedbugs, lice, etc. When the predisposing factors already mentioned are operative in subjects suffering from such pruritic affections as impetigo contagiosa, prurigo, urticaria, pediculosis, and scabies, ecthymatous lesions may develop as a secondary infection.

Pathology and Morbid Anatomy.

The pustule of ecthyma is comparatively large and deep-seated and develops as such primarily, and not from a preceding papule or vesicle. There is some difference of opinion in regard to the anatomical site of the ecthyma pustule, some claiming that it has its origin in the sebaceous follicle, while others disprove this by citing cases in which the lesion has developed on the sole of the foot where there are no sebaceous follicles. The anatomy of the lesion has not been sufficiently studied, however, to admit of conclusions upon this point. The formation of the lesion is accompanied by marked induration and inflammatory infiltration of the surrounding and underlying tissues, and the process extends through the entire thickness of the epidermis, invading the rete and upper layers of the true skin. It rarely extends through the entire depth of the corium to the subcutaneous connective tissues, consequently scarring is an exceptional occurrence. Pigmentation which is quite dense and rather persistent is a constant feature.

Diagnosis.

The pustule of ecthyma is to be distinguished from that of impetigo simplex, impetigo contagiosa, and the large, flat, pustular syphiloderm.

In *impetigo simplex* the pustules are much smaller, they are very superficially situated, they are but slightly indurated at the base, and have only a faint areola. They are, moreover, elevated and rounded or semiglobular in shape and not flat like the pustules of ecthyma. The impetigo pustule also runs an acute and rapid course, whereas that of ecthyma is slow in its development. It likewise shows no hemorrhagic tendencies and dries up into thin yellowish crusts, in contradistinction to the thick brown or blackish crusts of ecthyma. The distribution of the lesions is also different, those of impetigo simplex being commonly seated upon the face, hands, and fingers, while they are more often confined to the lower limbs in ecthyma. Finally

impetigo simplex is generally observed in children, who at the same time are usually in good health. The ecthyma pustule, on the other hand, is rarely seen in childhood and the subjects are broken-down in health and cachectic.

In *impetigo contagiosa* the pustules develop from a prevesicular stage; they are small and superficially situated; they are unaccompanied by an inflammatory induration at the base with a marked areola; they occur commonly upon the hands and face and tend to coalesce into patches. The disease also occurs most frequently in children who are otherwise healthy, and it is inclined to spread rapidly by contagion. The ecthyma pustule, on the other hand, always develops as such. It is large and deeply seated on an indurated base, is surrounded by a marked areola, it always occurs in a discrete manner, and is observed only in debilitated adults and chiefly on the lower limbs. It is contagious only under certain conditions. If ecthymatous lesions develop in the course of an impetigo contagiosa, other characteristic lesions of the disease can always be found somewhere on the body.

In the *large, flat, pustular syphiloderm* the lesions are generally quite numerous and are scattered over the body and limbs. They are large and flat, and though often surrounded by a red areola, they lack the marked induration at the base which characterizes the ecthyma pustule. The ulceration in this form of syphilitic lesion is rather deep and sharply cut, and a thick ichorous discharge covers the surface of the ulcer, which dries into dirty greenish crusts. These are quite bulky and are heaped up in a characteristic manner, simulating in appearance an oyster shell. When the shell-like crust falls off a smooth thin cicatrix is left. These features are all sufficiently characteristic to differentiate this form of syphilis from lesions of ecthyma. Moreover, other symptoms of syphilis would invariably be present and the lesions are quickly influenced by antisyphilitic treatment.

Prognosis.

The prognosis in this condition is favorable. The lesions yield quickly to treatment, but they reappear unless the predisposing factors are permanently removed. If allowed to go without treatment the process may continue indefinitely.

Treatment.

Inasmuch as this condition is distinctly one of want and misery, and is dependent largely upon the habits and environment of the individual which result in debility, cachexia, and general impoverishment of the system, efforts should first be made to procure a more

healthy and wholesome physical state. The general management of the patient—encouraging habits of cleanliness and sobriety, the establishment of better hygienic principles, and a sufficient and nourishing dietary—together with the employment of general tonics, are accordingly most important adjuncts to our treatment. Cod-liver oil, iron, quinine, nux vomica, cinchona, and hypophosphites are to be recommended, but alcohol and malt liquors are rarely required. Saline aperients, such as Startin's iron, magnesia, and sulphuric acid mixture (see p. 155), and the alkaline diuretics, acetate and citrate of potassium, will be found useful in some cases.

The *local* treatment is the same as for any other condition due to local pus infection and may be summed up in the words antiseptic and parasiticide. Alkaline or simple soap-and-water baths are necessary to cleanse the affected surface and to remove the crusts, after which antiseptic washes and strong parasiticide ointments are to be used. Iodoform in a five-per-cent. ointment is perhaps the most effective application that can be made to the lesions, which should be dressed at least twice a day. Other useful remedies are ichthyol, five to ten per cent. in zinc ointment; five-per-cent. white precipitate ointment; calomel three per cent. in zinc ointment.; boric-acid ointment (1:8); and salicylic acid three to six per cent. in zinc ointment. To guard against the development of fresh lesions by auto-inoculation antiseptic washes should be applied to the affected region several times a day. For this purpose, strong carbolic lotions, a ten-per-cent. solution of ichthyol, bichloride solution (1:1,500), a three- to six-per-cent. resorcin lotion, or strong boric-acid or salicylic-acid washes may be recommended.

In connection with the subject of ecthyma brief mention may be made of an affection occurring in very young infants in which gangrenous ulcers develop on the buttocks, thighs, and lower part of the body as sequelæ in some cases of varicella and vaccinia. It may also occur independently of these diseases in infants who are poorly nourished, in those suffering from gastro-intestinal disorders, and in tuberculous subjects. The affection is termed by the French *ecthyma infantile gangréneux* and also *ecthyma térébrant*, but is better known under the name *dermatitis gangrænosa infantum*. Pemphigoid bullæ are sometimes associated with the ecthymatous lesions and the affection is regarded by some as a variety of pemphigus. It is more than probable, however, that the disease is due to an infection with micro-organisms, and Ehlers has recently discovered the bacillus pyocyaneus in the lesions from two cases, in addition to the ordinary staphylococci of suppuration.

SYCOSIS.

Synonyms.—Folliculitis barbæ (Köbner); Acne mentagra (Fuchs); Lichen menti; Fr., *Sycosis non-parasitaire;* Ger., *Bartflechte, Bartfinne.*

Definition.

Sycosis is an acute or chronic inflammatory disease of the skin which is confined to the hair follicles and perifollicular tissues in regions where the hairs are coarse, and which is characterized by an eruption of pustules, papules, or nodular lesions, each of which, at one time or another, is perforated by a hair.

Much confusion has arisen in the use of the term sycosis, and many affections have from time to time been confounded with it. Two forms of the disease are ordinarily spoken of, non-parasitic sycosis and parasitic sycosis, the former representing the affection which we have just defined, the latter that form of folliculitis due to the presence of the ringworm fungus. This division of the subject is now no longer correct, inasmuch as modern bacteriological and pathological studies have demonstrated the fact that both forms are parasitic in nature.

The organism of the so-called non-parasitic sycosis is one of the ordinary pyogenic cocci of suppuration, the staphylococcus aureus or albus; or possibly several pus organisms may enter into the causation of the disease. The parasite of this form of sycosis therefore belongs to the schizomycetes and not to the hyphomycetes or fungus class, and if the term sycosis is to be retained for both forms of the disease the names suggested by Unna had better be employed—namely, "coccogenic sycosis" and "hyphogenic sycosis." It would be necessary, however, to add a third form to these, in view of the discovery by Tommasoli in Unna's laboratory of a special bacillus in a mild case of coccogenic or so-called non-parasitic sycosis. To this form Unna has given the name "bacillogenic sycosis," but clinically it can be distinguished from coccogenic sycosis only by its milder character.

For all practical purposes, however, it would seem better to drop the term sycosis entirely in speaking of that form of the disease which is due to the trichophyton fungus and call it tinea barbæ or trichophytosis barbæ. Sycosis without any qualifying term would then represent the coccogenic form of the disease or that formerly known as non-parasitic sycosis.

Sycosis is often designated by the unscientific name of "barbers' itch," but this term is obviously too comprehensive, for it would

rightly include impetigo contagiosa faciei, coccogenic sycosis, and tinea barbæ, as these are all very frequently contracted through the means of shaving.

Sycosis was regarded by the earlier writers as a disease which was limited to the bearded face, and the term is used in this restricted sense to-day by many authors, but it is plain that from our present knowledge of the nature of the affection a wider definition of the term is justified. The disease is an inflammation in and around the hair follicles excited by the action of pus-producing organisms, and though these invade chiefly the coarse hairs of the beard and mustache, because of the exposed position of the latter and for other special reasons, their action is not exclusively confined to them.

A primary inflammation differing in no way from a sycosis of the beard may therefore occur in connection with the hairs on other regions of the body, and the same etiological factors are operative in both cases. I have at present under my care a man with a typical sycosis on both cheeks and a more aggravated form of the disease upon both thighs, where the hairs are long and coarse. We may accordingly have a sycosis invading the region of eyelashes, eyebrows, vibrissæ of the nasal mucous membrane, or of the hairs which protrude from the ears; the hair follicles in the axillæ and upon the pubis in both sexes, as also those of the labia majora, scrotum, and thighs may likewise be the seat of a sycosis. A folliculitis of the scalp is generally secondary to an eczema in that region, the inflammation lingering in the hair follicles after the eczema disappears.

Symptoms.

The clinical symptoms in sycosis are extremely variable in the different cases, such variation depending largely upon the general constitution and habits of the patient. The primary eruption, however, is the same in all cases, the difference in the clinical appearances being due to the severity and extent of the inflammation and to the stage (acute, subacute, or chronic) which the disease is in at the time of observation. As it is ordinarily observed upon the bearded face the eruption begins as small, red, raised papules or even tubercles as large as a small split pea, each of which will be seen by close inspection to surround a hair. These develop into pustules rather rapidly in most cases, though the rate and amount of pustulation varies in different individuals and also in the same case at different times. This, I think, is principally influenced by the general condition of the patient at the time. There are usually more pustules than papules present in the acute stage, and their size varies according to the severity of the infection.

At first only a few lesions appear and they are isolated, but others soon develop near them and if several lesions coalesce they form a tubercle. When numerous lesions are closely situated, as they are sometimes in an acute attack, there may be considerable inflammatory infiltration of the tissues. More often, however, this is not observed at first, for the lesions on a given area, though they may be rather close together, make their appearance in a subacute manner, and develop rather slowly without accompanying inflammatory symptoms.

The area occupied by the eruption is variable; the disease may be limited to a single patch situated on any part of the bearded face, either on the cheek, chin, or on the front or sides of the neck; frequently it is limited to the central segment of the upper lip and may remain thus localized for months without appearing on any other part of the face. A sycosis of the upper lip is, I believe, always secondary to a nasal catarrh; the acrid discharges running down over the lip set up an eczematous inflammation which is followed by an inflammation of the hair follicles. The disease is usually limited to an area the width of the nares and the skin is greatly thickened and distinctly eczematous in character with scaling and moisture; pustules develop rather infrequently on the diseased surface. Sycosis in this region is extremely chronic and is very rebellious to treatment.

Instead of remaining confined to a limited area, which as already stated may be situated anywhere upon the face, the disease may spread by the formation of new lesions at the periphery; or new regions may be invaded, as the result of which one or both cheeks or even the entire bearded area may be affected. As a general rule the eruption is symmetrical, though one side may be more extensively affected than the other.

The hairs during the early papular stage are firmly set and are extracted with difficulty and with the production of much pain; their root sheaths are found to be swollen and vitreous, even thus early, as a result of serous infiltration. If they are allowed to remain suppuration advances, the pus enters the follicle and works its way to the surface, and the hair becomes loosened and can be easily extracted without pain. The thickened root sheaths come away with the hair as a succulent mass infiltrated with pus.

If the process is a mild one, healing may take place with the formation of thin brownish crusts, and destruction of the follicle does not occur; the hair will therefore regrow and there will be no scarring. In severer cases the numerous pustules coalesce, with the production of a condition not unlike chronic eczema; the skin becomes red, thickened, and more or less soggy; pustules develop upon

the surface, and these dry up into thin yellowish or brownish crusts each of which is perforated by a hair. When the crusts are removed the hairs are generally left standing in small shallow depressions filled with pus. If the inflammation is deep the process destroys the follicle with its hair papilla and more or less of the surrounding tissues, and results in permanent alopecia and scarring.

Occasionally the red, infiltrated area produced by the extension of the inflammation to the interfollicular tissues assumes a succulent fungoid aspect, similar to the condition usually observed in tinea barbæ. Papillary excrescences develop on the inflamed surface, which are elevated and red, and bleed very easily. The surface is kept moist by a viscid secretion, which dries into rather thick crusts. The whole plaque is raised considerably from the general surface and may be an inch or more in diameter; its surface is uneven or bossy, and the hairs are loosened. This condition is most often seen in the sulcus between the lower lip and the chin. In addition to the lesions already described, boils and abscesses are not infrequently observed resulting from the coalescence of closely situated lesions. Hard tubercles first form, their size depending upon the number of follicles implicated, but these soon become soft and fluctuating; the hairs are loosened, and the surface presents a cribriform appearance, with pus oozing from the follicular openings.

The first symptom of a sycosis is generally a stinging or pricking pain associated with exquisite tenderness upon the slightest movement of the hair. This is often experienced some time before there is any redness or sign of suppuration. These symptoms are soon accompanied by more or less swelling of the affected area, and as the inflammation becomes more marked there is a sensation of intense heat or burning.

The disease usually runs a very chronic course, extending over a period of months or years with remissions and exacerbations. It may even last in this way fifteen or twenty years. Frequent acute outbreaks occur throughout the course of the disease and isolated papules and pustules are developing more or less all the time. In long-standing cases the interfollicular tissue becomes the seat of an eczematous inflammation with infiltration, redness, moisture, and here and there crusts, all of which features afford a good soil for the growth of the sycosis organisms. Pustules are therefore found in varying numbers and in various stages of development, interspersed among the crusts and excoriated patches. In addition there is always a partial permanent alopecia with numerous small cicatrices marking the site of former lesions. This gives a peculiar ragged appearance to the beard which is rather characteristic. In some of

these very protracted cases the inflammatory symptoms are only slightly marked, though the skin remains red, somewhat scaly, and more or less thickened. Upon this surface a few isolated pustules appear from time to time. After the disease is apparently cured it often relapses if the beard is allowed to grow.

Variations.

There is observed, though very infrequently, a form of folliculitis or sycosis of the beard with clinical features that resemble very closely those of lupus vulgaris. Milton gave the name "lupoid sycosis" to this form of the disease, though pathologically it bears no relation to lupus. Unna, more recently, has described the affection under the name of "ulerythema sycosiforme."

The lesions are much more destructive than those of ordinary sycosis, the ulceration extending beyond the hair follicle, implicating even the sebaceous glands (Robinson). The scars and atrophy are more pronounced than in ordinary sycosis. A peculiar feature of the eruption is the tendency to spread by peripheral extension. The lesions may be papular, vesicular, or pustular and they generally begin on the cheek, the inflammation spreading slowly downwards with a narrow well-defined erythematous margin. There is marked infiltration of the skin, followed by destruction of the hair follicle and perifollicular tissues and consequent scar-tissue formation. When the inflammation is less intense and there are no pustules present, the patch may resemble lupus erythematosus, there being only a well-defined redness with some infiltration and scaling. Pustules appear from time to time, however, and the patch enlarges by the development of new pustules at the periphery. The process may stop entirely for a time but it generally begins again on some other part of the face. The disease spreads very slowly and is extremely chronic and rebellious to treatment.

Sycosis on other regions than those covered by the beard presents special features that require separate mention. Sycosis of the eyebrows may occur as an independent process, but more often there is an accompanying blepharo-adenitis or a sycosis of the beard. A folliculitis of the lashes is generally secondary to an eczema of the lids, and a sycosis of the nasal vibrissæ is associated with a catarrhal inflammation of the nasal mucous membrane. A folliculitis of the hairs which protrude from the ears is secondary, generally, to a fetid otorrhœa. Sycosis of the axillæ, pubis, or scalp, is secondary to an eczema in these localities, a folliculitis remaining after the eczema has cleared up. Folliculitis of the scrotal, labial, or the axillary hairs is generally associated with profuse sweating, and is observed

more often in those who bathe infrequently. In the two last-mentioned localities boils occasionally develop in connection with the folliculitis. Sycosis of the thighs generally occurs as an independent process, but it may sometimes be associated with the disease on the face, as seen in the personal case already cited. As regards sycosis of the scalp, while it is generally preceded by an eczematous inflammation, I have seen several cases where a folliculitis developed independently and apparently in an idiopathic manner. In these cases the folliculitis was confined to a single small circumscribed area, and many of the hair follicles were destroyed.

Etiology.

Sycosis undoubtedly depends, to a certain extent, upon the presence of pus-producing organisms, the staphylococci albus, aureus, and citreus, as one or another of these has been found to be invariably present in the lesions. Bockhart [1] proved that pus cocci in the tissues were capable of setting up a perifollicular inflammation with the characters of a sycosis; and furthermore, that the same organisms were the exciting factors in the causation of impetigo and furunculosis. Tommasoli [2] demonstrated a bacillus in the lesions of a mild case of ordinary sycosis which he and Unna have termed the "bacillus sycosiferus fœtidus." With pure cultures of this organism Tommasoli succeeded in producing, by inoculation upon his own skin, typical lesions of sycosis.

At the present day when the minds of the whole scientific world are occupied with the exceedingly interesting and enticing subject of parasitism, too great significance is often attached to the micro-organisms that are found associated with disease processes in general. To assign a specific etiological value to the organisms thus found is the general tendency, and to those just mentioned as belonging to sycosis that distinction has been accorded by many. Nevertheless, inoculation experiments with pure cultures of these organisms more often fail than succeed in reproducing the disease. Moreover, organisms of this character are ever present in the normal skin; still sycosis, furunculosis, and impetigo are comparatively rare diseases. Some have also attributed the disease to a local form of irritation, such as shaving, but sycosis is observed about as often in those who never shave as in those who shave regularly.

We must admit that some agents acting locally do contribute somewhat to the production of the disease and the growth of the organisms, and in a sycosis affecting a beard that has been allowed to grow the lodgement of these next to the skin acts as a source of irritation. Various kinds of dirt, including dust which is peculiar to

certain trades or occupations, decomposing sweat, and strong irritating soaps may be cited as examples.

That there are other and more important factors, however, which enter into the causation of every case of sycosis I am firmly convinced. The soil is rendered favorable for the growth and development of the germs by some underlying constitutional state, and these so-called predisposing factors must be fully appreciated if we expect success to attend our treatment of the affection. This is true not alone of sycosis but of many other affections of the skin that are universally recognized as distinctly parasitic in nature.

The constitutional condition that predisposes to the production of sycosis bears a close relationship to that which leads to certain forms of eczema, but this does not imply that sycosis is simply a pustular eczema. In the majority of cases the lesions are unaccompanied by an eczematous condition but develop in an isolated manner with areas of healthy, non-inflamed skin between. The factors that are potent in rendering the soil favorable for the development of a sycosis are those which produce a general lowered state of the nutrition. Faulty assimilation, particularly as regards proteid substances, a highly acid state of the system, gout, and gastro-intestinal disturbances, may all be regarded as important predisposing factors.

Sycosis is not generally considered to be contagious, but if the skin is vulnerable to the incursion of pus organisms, it may be conveyed from one person to another similarly predisposed, and can therefore be contracted at the barber's.

Pathology.

Sycosis is an inflammation in and around the hair follicles. The first changes take place in the perifollicular tissues, the morbid process extending from this region to the follicle itself. The hair follicle is ultimately converted into a small abscess, as was shown by Wertheim, who in 1861 made a careful microscopical study of the hairs in this disease. He observed that the diameter of the hair of the beard was greater in proportion to the diameter of the hair sheath than in any other region of the body, and that it was therefore relatively too large for its follicle. As the pus must work from below upwards, it would thus meet with great resistance and would collect and form a small abscess. Studies by Robinson [10] in 1877, upon sections of skin taken from the living subject, have given us a clear understanding of the changes that actually take place in the skin. He found that sycosis is primarily a perifollicular inflammation and not, therefore, a disease of the hair follicles, as generally supposed.

The changes are those of an exudative inflammation of ordinary

vascular connective tissue. Transudation of serum and white blood cells takes place, and the products of inflammation penetrate the hair follicle, producing a swelling and disintegration of the cell elements. Even before rupture of the sheaths of the follicle takes place, the hair root is softened and swollen by sero-purulent infiltration, but as the process advances, the hair root and its sheaths are destroyed, and by a corresponding destruction of the follicle lining and the adjacent tissue the hair is loosened. The inflammatory changes begin at the fundus and extend upwards, the pus slowly working its way to the surface. When the hair is removed a succulent mass is found attached to the bulb, which is composed of the broken-down sheaths infiltrated with pus; the follicle is also lined with pus cells. The destructive process seldom involves the hair papilla and therefore permanent alopecia does not ordinarily result. The inflammation extends from the hair follicle to the sebaceous glands and in severe cases these may be destroyed. The sweat glands are only occasionally affected.

In lupoid sycosis the follicle, hair papilla, and surrounding tissues, as well as all the glands in the area affected, are destroyed and are replaced by scar tissue; permanent alopecia of course results in these cases.

Diagnosis.

Sycosis is often confounded with other diseases and this is especially true of sycosis of the beard, for several affections may occur in this locality which at one time or another display papular and pustular lesions. As these, in some instances, are seated at the hair follicles, having a hair or hairs protruding from their centres as in a sycosis barbæ, the likeness to the latter disease is often very striking. It is, therefore, necessary to observe the greatest care in the diagnosis of every papular or pustular eruption that appears upon the bearded face. For these reasons that which follows has reference to the eruption only as it occurs in this locality.

The characteristic features of the disease are an inflammation of the hair follicles resulting in the formation of papules, pustules, and tubercles, which appear frequently in an isolated manner and are necessarily perforated by the hair.

The diseases that are most liable to be confounded with it are eczema, tinea barbæ, syphilis, lupus, and acne.

Eczema is probably more often mistaken for sycosis than any other affection, and it must be remembered that a sycosis of the nasal mucous membrane and of the upper lip is generally secondary to an eczema in these localities. It is from the slighter and more chronic

cases of sycosis that eczema is chiefly to be differentiated. In eczema the inflammation is rarely confined to the bearded part of the face, but extends at some period in its course to the regions beyond; if it does not do this, a previous history of the disease in other localities can usually be elicited. The inflammation in eczema does not begin in the follicles, though pustules perforated by hairs often appear at the periphery of the inflamed area. In this case, however, the pustules are not deep-seated, and weeping or crusted areas characterizing an eczema are invariably present.

The eczematous inflammation is always superficial, and extraction of a hair surrounded by an eczema pustule causes much pain, for it is firmly set. In sycosis, when the lesion has reached the pustular stage the hair is generally loosened and can be extracted without much pain. Moreover, the root sheaths of the hair in eczema are found to be swollen only at the upper part and not all the way down as in sycosis. An eczema of the beard of long standing may sometimes subside and as the inflammation disappears a folliculitis remains. But a history of the preceding eczematous condition will distinguish this folliculitis from a primary sycosis. It must not be forgotten, also, that a sycosis, if severe, may be accompanied by eczematous infiltration, weeping, and crusting. In eczema, finally, there are never cicatrices or bald spots in the beard as a result of the inflammation, and the disease is generally accompanied by marked itching and burning, which are slight or absent in sycosis.

In *tinea barbæ*, or ringworm of the beard, the onset is rather insidious, the first eruption usually being a superficial ringed and scaly, red patch accompanied with some itching. Ordinary sycosis, on the other hand, develops more suddenly, with pain and swelling of the part, and with the formation of scattered pustules. When the ringworm fungus penetrates the hair follicle, variously sized nodules or hard red lumps are formed. Pustules perforated by hairs, like those in ordinary sycosis, are seldom seen.

These tubercles usually develop without the pricking or burning sensations observed in coccogenic sycosis, and the lesions do not appear at intervals as in the latter disease, but are forming all the time. Although the lumps are hard (because of the absence of suppuration), the hairs are loosened very early in the disease and often fall out spontaneously. Their nutrition is also quickly affected and they become brittle and dull, and are often kinked or twisted; their extraction causes no pain, the very opposite of which obtains in the early stage of sycosis.

The irregularly shaped tubercles may be more or less isolated, but with the advance of the process they fuse together into a sharply

defined, indurated, raised, lumpy mass. The uneven surface is covered with loosely placed hairs which are embedded in thick crusts, and when these come off the hairs come with them. It is well in every case to soak a few of the hairs in equal parts of glycerin and liquor potassæ and examine them microscopically under a cover-glass. If we have to do with ringworm of the beard, the small round spores of the trichophyton fungus will be found in abundance round the root of the hair.

Syphilis, when it appears upon the bearded face, ought to be readily distinguished from sycosis. The papular syphilide or the small pustular syphiloderm, especially the latter, would rarely be limited to the face. Moreover, the sharply defined, punched-out character of the small ulcer left by a pustule of syphilis is observed only in that disease. A late papular syphilide is sometimes confined to the face, but evidences of the disease in other parts can always be found. The "raw-ham" color, the grouped arrangement of the papules, and their slow development without subjective symptoms, would characterize a patch of this form of syphilis. The late ulcerating syphilide, the so-called papulo-tubercular form of the disease, may be limited to the face, but it is generally not symmetrical. Upon removal of the crust in a tertiary lesion of this character a kidney-shaped, or an irregularly outlined sharply cut ulceration is revealed. The inflammation is not confined to the hair follicles as in sycosis, and evidence of former lesions or others present at the time can generally be found elsewhere.

Lupus vulgaris generally begins at an early age, but occasionally it develops in an adult and would have to be distinguished from sycosis. The primary lesion in lupus is a small tubercle, which is soft and semi-transparent, having the appearance of "apple jelly." It does not disappear under pressure with the finger and is not perforated by a hair. The lupus patch made up of these small nodules runs a very slow chronic course without pain or other subjective symptoms, and results in destruction of the skin with the formation of scar tissue. All these features are sufficient to distinguish it from sycosis.

Lupus erythematosus resembles very closely that variety of sycosis already described as lupoid sycosis, but it is much slower in its course. The disease occurs most frequently in females, however, and is generally observed as a sharply defined, slightly raised, red, scaly patch extending symmetrically across the bridge of the nose on to the adjacent part of the cheeks. It generally begins therefore on a non-hairy region and there are no papules pierced by hairs.

Lupoid sycosis may be distinguished from ordinary sycosis, according to Unna, by the sharp definition of the interfollicular

erythema, the superficial character and chronicity of the eruption, and the patchy arrangement of the scars. He also claims that the lesions begin primarily as vesicles.

Acne would rarely be mistaken for sycosis, for its lesions are generally to be found on non-hairy parts which are rich in sebaceous glands, such as the back, shoulders, forehead, etc. The pustules are usually larger and more superficial and are not always perforated by the hair.

Prognosis.

The prognosis of sycosis is favorable, though the disease is often most obstinate and rebellious to treatment. Spontaneous recovery may take place in a few weeks, but generally an untreated case goes on with greater or less severity for several months or even years. It never endangers life, and the worst that can happen in a severe and chronic case is an extensive destruction of the hair follicles with permanent partial or more general alopecia. The disease is curable and the amount of deformity often depends upon the success of the treatment. A permanent cure should, however, never be promised, for the affection is liable to relapse. With regard to sycosis of the upper lip the prognosis should be based upon the chronicity of an existing nasal catarrh and its behavior under treatment.

Treatment.

For the successful treatment of a case of sycosis a thorough understanding of the nature of the affection, and the closest attention to details are absolutely essential. Because it is a local disease, due largely to the action of pathogenic organisms upon the tissues, it does not follow that the employment of one or another form of antiparasitic treatment is all that is necessary. In sycosis, as in many other parasitic skin diseases, the skin is rendered vulnerable by certain predisposing influences and constitutional states which, if allowed to go on uncorrected, militate against the successful management of the disease. I do not deny that the eruption can be removed by local means alone, and that acne and other similar affections can be healed in like manner, but I do claim that quicker and more permanent results are obtained by the use of intelligent and well-directed general treatment in addition to the local measures employed. Every influence, therefore, that may act as a predisposing factor in any individual case, whether it be from without or be a part of the general economy, should be sought after and removed if possible.

Avoidance of the external irritating agents that predispose to the disease would act in a prophylactic way against a future invasion of the germs. Cleanliness and good hygiene are, therefore, important ele-

ments, and if extreme temperatures or injurious forms of dust, dyestuffs, etc., cannot be avoided on account of the patient's occupation, it may be necessary to change this to prevent subsequent attacks. If the beard is long and the disease is kept up by injurious substances next to the skin, regular shaving will generally stop the infection.

The *internal* predisposing influences are much the same as those observed in eczema, to which disease sycosis unmistakably bears a close relation. Every deviation from the normal performance of the bodily functions should be corrected, and in acute cases of the disease a brisk purge with five or ten grains of blue mass or a full dose of calomel will be found of great service. Gastro-intestinal disorders, gouty and rheumatic tendencies, and conditions resulting from faulty assimilation, all predispose to this disease and should receive due attention. The alkaline diuretics, citrate and acetate of potassium, and the mineral acids, according to indications, are of undoubted value. A general lowered state of nutrition would call for iron and general tonics. Cod-liver oil is a particularly valuable remedy, and in strumous subjects it materially lessens the natural tendency to increased suppuration. Calcium sulphide is a useful remedy for controlling suppuration if given in the form of gelatin-coated granules in quarter-grain doses every two hours. Hyposulphite of sodium, ten grains three times a day, would serve a like purpose. Donovan's solution has been recommended in chronic cases where there is considerable infiltration. Bulkley advocates the use of arsenic in full doses for an extended period, and has succeeded in checking the eruption in this way with little or no local treatment.

In all cases of sycosis a non-stimulating diet is to be recommended and alcohol, tea, coffee, and tobacco should be interdicted or greatly restricted. I believe sycosis in one addicted to the habitual and abundant use of alcohol is practically incurable. A case in point is a young man with these habits, who comes to my clinic from time to time with an acute outbreak of pustules upon an infiltrated and reddened surface. This patient has been under my observation more or less for seven years and is much worse to-day than he was seven years ago, for the disease has invaded the entire bearded area.

The *local* treatment of sycosis is obviously of the greatest importance, and no case can be cured without it. In our selection of remedies, however, we must not lose sight of the fact that the disease is an inflammatory one, and though chronic in its general course, each outbreak is an acute inflammation. Powerful antiparasitic remedies would, therefore, only further irritate and inflame the skin, thereby increasing the trouble instead of diminishing it. The very mildest astringent applications, such as would be indicated in any acute in-

flammatory process, are generally of the greatest service in this disease. As the inflammation becomes less intense and approaches a subacute or chronic stage the remedies should be strengthened accordingly.

Preliminary to the use of the local remedies the subjects of shaving and epilation should receive careful attention. Unfortunately these are points upon which equally good authorities differ, some recommending and others strongly opposing the operations. The probable truth of the matter is, that both classes of observers are correct, for either or both of the operations prove beneficial in some cases and at certain times, while in other cases and at other times either or both are decidedly harmful.

Shaving is unquestionably a most important preliminary to the successful treatment of many of the cases, but I believe it is largely a matter of individual susceptibility. Hebra's teachings were to shave every day and Bulkley advocates daily shaving; he recommends a very sharp razor, and that the surface be gone over but once and not too closely, after a prolonged and thorough lather with a non-irritating soap. I have obtained the very best results from the practice of daily shaving in the manner indicated, but this does not hold good for all cases. Some skins cannot stand such frequent shaving, even when not diseased, though I think these are exceptional instances. In beginning the treatment of a case I always direct the patient to shave every day, and even when the face is pretty sore this can be done with but little pain after the first time. The hairs should first be clipped short, and the crusts removed by laying on strips of lint soaked in sweet oil, or a starch or bread poultice may be applied. It is often not necessary to shave over the very worst places, for here the hairs are generally loosened and can be pulled out easily. If good is to come of such frequent shaving the improvement will be noticed at once, and the patient is generally anxious to continue.

In very many cases, however, every second or third day will be found to be frequent enough, not only because daily shaving increases the trouble, but the beard grows much slower in some people than in others and such frequent shaving is unnecessary. If individual susceptibility is considered in regulating the frequency of the operation, it rarely happens that it does not prove a valuable adjunct to our treatment. A ready explanation of its beneficial effects is to be found in the nature of the affection itself. A hair protruding from an inflamed follicle is subjected to more or less movement throughout the twenty-four hours, by the hands, towels, pillows, or what not; it then acts as a mechanical lever, with the fulcrum at the skin level, and is therefore a source of almost constant irritation. Shaving renders this impossible, and for these reasons I do not favor the substitution

for this operation of a close cropping of the beard with the scissors, as advocated by some. After the disease is cured, shaving should be kept up for at least a year, or a relapse of the trouble may be expected.

Epilation should be practised, in my opinion, only after the hairs have been loosened by the process of suppuration, and in certain cases of long standing where there are a few very indolent lesions that do not yield to treatment. All hairs that are found, by gentle traction with the forceps, to be loosened should certainly be removed, for they only serve to keep up the irritation, and their removal will allow the pus to escape and the remedies more readily to penetrate the follicle. The extraction of firmly seated hairs is not only exquisitely painful, but it is productive of much harm in the cases that are ordinarily met with. The general epilation that is practised by some, even though improvement may follow in certain cases, seems cruel and is scarcely warrantable, when the same end can always be attained by less heroic measures. This form of epilation, however, may be justifiable as a last resort in certain very severe and intractable cases that are influenced by no other form of treatment.

In the acute stage of the disease, when there is much pain and more or less inflammatory swelling, the most soothing remedies only should be used. Zinc ointment, with twenty grains of calamine and half a drachm of tincture of camphor to the ounce, is a most grateful application, and should be smeared on thickly with the finger two or three times a day. Zinc ointment, with ten grains of salicylic acid to the ounce, may be used in the same manner, or a calamine and zinc lotion sopped on several times a day will be found beneficial. It is sometimes advantageous to add lotio nigra to the calamine and zinc lotion; the use of the black wash alone is also recommended by some. After the acute inflammation has subsided more astringent applications may be made, and rose-water ointment, with a drachm of tannic acid and five grains of carbolic acid to the ounce, will prove effective. Lassar's paste spread thickly upon lint and bound on is also serviceable in this stage of the disease.

In the subacute stage nothing answers better, as a rule, than Hebra's diachylon ointment, made according to the formula in the German Pharmacopœia. It should be spread thickly upon the rough side of lint and bound on to the surface at night, and a thin layer of it can be kept on during the day. The following ointment is also of the greatest value:

℞ Acidi carbolici, ...	gr. v.
Bismuthi subnitratis, ...	ʒ ss.
Unguenti hydrargyri ammoniati, ...	ʒ ij.
Unguenti aquæ rosæ, ...	ʒ vi.

M.

Other mercurial preparations are likewise of great service, such as the oleate of mercury in two- to five-per-cent. strength, calomel half a drachm to the ounce of zinc ointment, a weak citrine ointment, or a mild ointment of the red oxide of mercury. In most cases it is better to spread the ointments on lint and bind them on when practicable. Other useful remedies in this stage are sulphur, in a four- to six-per-cent. ointment, ichthyol five to ten per cent. in zinc ointment, and a two-per-cent. ointment of beta-naphthol.

In a more chronic stage with considerable infiltration of the skin the above remedies can be used in greater strength, or one or another of the tarry preparations may be employed. Unguentum picis et zinci will be found serviceable in this stage, but I have obtained better results with the following combination with the oil of cade:

℞ Olei cadini,	ʒ ij.
Hydrargyri oxidi rubri,	gr. xxiv.
Hydrargyri ammoniati,	ʒ iss.
Sulphuris sublimati,	ʒ ij.
Lanolini,	℥ ij.

M.

This ointment spread upon a strip of lint and applied to the upper lip will be found a useful application to a sycosis in this locality, which is generally very rebellious to treatment. Sycosis of the upper lip, however, is invariably associated with a nasal catarrh, and unless this condition is treated at the same time, a permanent result cannot be expected.

The treatment here given is likewise appropriate to sycosis on other parts of the body, the strength of the remedies being governed by the texture of the skin in the locality affected and the amount of inflammation present.

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PHLEGMONOUS

AND

ULCERATIVE AFFECTIONS.

BY

H. RADCLIFFE CROCKER,

LONDON.

PHLEGMONOUS AND ULCERATIVE AFFECTIONS.

FURUNCULUS.

Synonyms.—Boils, furuncle; Fr., *Furoncle;* Ger., *Furunkel.*

Definition.—An acute, circumscribed, necrotic suppuration of a skin gland or follicle and the connective tissue immediately around it.

Description and Course.

Boils date in history from the time of Job and Hezekiah, but it is only in the last few years that their true pathogeny has been understood and the right principles of treatment have been evolved from this understanding. While the process may begin and end in a single boil on an individual, in the great majority there is a succession of one or more boils which keep up what is called the process of "furunculosis" for an indefinite period. Each lesion commences as a painful induration in the corium, the skin over which soon becomes deep red, and as the lump enlarges it approaches and then projects above the surface, and forms a rounded nodule from a split pea to half a plum in size. The smaller nodules usually "point" and a pustule develops at the apex, but the larger simply soften in the centre, which gets a deep dusky hue, while a bright-red areola encloses the protecting portion. The softened centre breaks down into a hole, through which pus discharges or can be pressed out, and a day or two later the "core" separates in the shape of a dirty-white pultaceous portion of necrotic tissue, and the fever, burning, throbbing, and extreme tenderness, too familiar to almost every one, rapidly subside. The process of healing can then commence; the induration and swelling round the suppurating cavity diminish, the redness fades, and the lost tissue is replaced by granulation and later cicatricial tissue, a permanent scar resulting.

Sometimes the inflammation resolves without suppuration, constituting what is popularly called a "blind boil."

The constitutional disturbance attending a large or several

smaller boils is often considerable, and the loss of rest from the pain, and perhaps the absorption of toxins, add further to the evil effect on the patient. Neighboring lymphatics and glands are also liable to sympathetic inflammation, which, in the case of the latter, may also result in suppuration. The above description represents the course of a boil unmodified by treatment.

Boils occur chiefly on the neck, face, forearms, buttocks, and legs, but no region of the body can claim absolute exemption.

There is an important variety of boils connected with the sweat glands, which are placed in this work under the diseases of the sweat glands, and need not, therefore, be described here.

Etiology.

Single boils are often the indirect result of a slight injury, such as friction, pressure, blows, etc. Boils on the buttocks from such causes are very common. Crops of boils often occur in persons who are under vitally depressing influences, such as sewer-gas poisoning or other septic influence, of which examples may be seen in septicæmia, uræmia, variola, and other specific fevers. Diabetes, especially diabetes mellitus, is familiar to every student as a strongly predisposing influence, and the latter indeed is true of all the above etiological factors, as they only afford favorable conditions for the development of the true materies morbi. In a large number of persons no defect of health or surroundings is discoverable. It has been proved that boils are inoculable by the conveyance of the pus from person to person, directly or indirectly, and also that they are autoinoculable by the finger nails or other means of conveying the pus from one part of the body to another.

Pathology.

It is now definitely established that the true cause of boils is the presence in the tissues of micro-organisms—viz., Staphylococcus aureus, and to a lesser extent albus and citreus. These can always be found in the pus of boils, and cultures of the same organisms are inoculable. Schimmelbusch, of Cologne, had a pure culture of Staphylococcus aureus rubbed into the skin of the thighs of two young persons dying of septicæmia. Pustules formed on the surface containing the same organism in abundance, and in one of the patients a boil was formed. The microscope showed that there was no lesion of the skin, but that the organisms had penetrated along the hair shafts into the follicles and thence into the neighboring tissue. Every boil, therefore, is a nidus for the pus cocci, and these pass along

the lymphatics or into the blood-vessels and excite other boils, either in the neighborhood or at a distance. It is supposed that the irritation of the presence of these cocci produces blocking of the vessels round the follicle and thus leads to the death of the portion of tissue deprived of its nutrition. The slough thus formed is got rid of by inflammation and suppuration.

Diagnosis.

This seldom offers any difficulty, even to the patient.

The difference between boils and *carbuncles* is mainly due to the deeper implantation of the same micro-organism. The carbuncle commences in the subcutaneous tissue and works its way along the planes of connective tissue as well as towards the surface. There is thus no limit to the size of a carbuncle, and a brawny induration round an acutely inflammatory central tumor is formed, with multiple points of suppuration and a strong tendency to lateral extension. It is this latter tendency, and the consequently much larger size of the carbuncle, and the multiplicity of points of suppuration which distinguish the carbuncle from the boil. Carbuncles are chiefly situated on the nape of the neck or on the back, but they may also occur on the extensor aspect of the forearms.

Treatment.

The primary aim should be to destroy the micro-organisms which cause the lesion as early as possible. If suppuration and softening of the centre have already occurred, the boil should be incised, the contents gently pressed out, and then the cavity syringed out with carbolic-acid lotion 1:40. Iodoform or loretin should then be dusted on and in the boil if possible, and the whole covered with alembroth wool,* fastened on to the skin with collodion. Care should be taken not to squeeze boils to evacuate all their contents, as this will often convert a small boil into a large one.

If the boil has not gone on to suppuration—*i.e.*, is in the blind stage, it may be aborted by injecting a drop or two of carbolic acid, 1:40, into the skin beneath it. One or other of these measures should be adopted for every lesion as soon as possible, for it must be remembered that antiseptic treatment to be successful must be performed thoroughly, or it is worse than useless.

* Alembroth wool contains 2 per cent. of sal alembroth (ammonio-mercuric chloride).

Many patients, however, through either prejudice or fear, refuse surgical interference and other measures have to be adopted which, though not so effectual, tend to produce the same effect, but much more slowly. The time-honored linseed poultice is not one of these measures and should be abolished, as it is itself a cultivating medium for the pus cocci, and its temporary soothing effect is dearly purchased by its being the means of transplanting organisms into the neighboring parts. Antiseptic applications, such as boric-acid lint dipped in hot water and covered with oiled silk, are the only forms of poultice which should ever be employed. A saturated solution of boracic acid constantly applied will often abort a boil and will always limit the degree of suppuration.

Other means to abort boils are numerous, but all proceed on the same principle. Such are the frequent application of spirit of camphor for several minutes by means of compresses; painting tincture of iodine on and round the boil, three or four times a day, until desquamation occurs; or nitrate of silver gr. x., spiritus ætheris nitrosi, ʒ i., may be painted on and allowed to dry; or strong carbolic acid, nitrate of mercury solution, or even nitric acid may be cautiously applied with the end of a match.

Some apply special plasters; the emplastrum hydrargyri of the German or English Pharmacopœia spread on linen, a ten-per-cent. salicylic-acid soap plaster, and Unna's carbolic-acid mercurial plaster are among the best. It is a good plan to sponge the skin thoroughly with a 1: 2,000 bichloride of mercury solution, or with carbolic acid 1: 40, before applying the plaster.

Ointments such as the hypochloride of sulphur ʒ i. to ℈ i., or sublimed sulphur ʒ i., carbolic acid ʒ ss., lard ℈ i., may be used spread on lint and closely applied. Success may be obtained by any of these methods if thoroughly carried out, but they are inferior to the surgical procedure first described.

Although the author places the antiseptic treatment far before any other, general and hygienic treatment is often useful and sometimes imperative. Staphylococcus aureus is almost ubiquitous, and where the tissues of the patient appear to be especially vulnerable, as in diabetes mellitus, it would be the obvious course to adopt all the measures possible for the relief of that condition. Similarly, in every case of apparently causeless boils or abscesses, the hygienic surroundings of the patient should be carefully remedied as far as possible.

No special dietary has any effect on boils except in the case of diabetes, but inasmuch as the products of suppuration have a strong vitally depressing effect, the dietary should be on the liberal side,

unless the patient is gouty. The determination of the form and quantity of alcohol to be taken should depend on the actual state of health of the patient, and not on the mere fact of the presence of boils.

Certain more specific remedies have been used with apparent benefit when there have been no special indications to follow. A popular remedy, for which there appears to be some justification, is fresh yeast, half a wineglassful to be taken night and morning. Sulphide of calcium in coated pilules, gr. ¼ three times a day, or gr. $\frac{1}{10}$ every four hours, has also been recommended by Ringer, and the author believes that he has seen benefit from both these remedies, though he would place yeast first, without being able to explain its action. At the same time these, as well as tar water, ammonia and bark, and other empirical remedies, will assume a more and more modest place in the therapeutics of furunculosis, in proportion as the principles and practice of local antisepsis are grasped and carried out.

FURUNCULUS ORIENTALIS.

Synonyms.—Oriental boil; Oriental sore; Aleppo boil; Biskra or Biscara button; Delhi boil; Gafsa button; Kandahar sore; Pendjeh sore; Natal sore, etc. Ger., *Orientbeule;* Fr., *Clou de Biskra.*

Definition.—A local endemic disease of hot climates, chiefly attacking the face and uncovered parts, and characterized by the successive formation of a papule, a nodule, a scab, and beneath this a sharply punched-out ulcer with later a thickened border.

This is a very common disease in certain districts with tropical or subtropical climates from 23° to 45° N. and from 2° W. to 80° E. The local names, while indicating districts in which it is very common, do not indicate all the places in which it occurs. It is not uncommon on the southern and eastern shores of the Mediterranean (Morocco, Algeria, Tunis, Egypt, and Asia Minor), and occurs also in Crete and Cyprus, in the Crimea, and extensively in Persia. It is not known in the West Indies.

The first account of this disease was by Russell, who described it as seen in Aleppo in 1756, while the writers since then are too numerous to mention.

Symptomatology.

The disease is of local and not constitutional origin, and there are no symptoms of general disturbance. After inoculation there is a period of incubation of from three days to several months.

It occurs chiefly on uncovered parts, especially the face, and while the cheeks, angles of the mouth, orbits, alæ nasi, and ears

are most frequently attacked, no part of the face is exempt. The extremities, chiefly the back of the hand and the foot, are sometimes the seat of the sore, but it is rare on the trunk and pubes and never affects the scalp. There is usually only one boil, but there may be several, and ninety on the face and body have been recorded.

The first lesion is a red papule which has been compared to an irritated mosquito bite. This gradually enlarges to a nodule the size of a pea or bean, of a pale or dull-red color, and for a time, which may be even weeks or months, there is no breach of surface; but when the little tumor is examined with a lens, deep-seated yellowish-white points like milium can be seen studding the surface. When the nodule gives way in the centre then clear serum begins to ooze and dries into a closely adherent brown or dark-greenish crust. Disintegration of the nodule proceeds beneath the crust, which gradually enlarges in thickness and area, and is surrounded by a red areola. If the crust is removed a round, sharply punched-out ulcer is revealed from three-quarters to two inches in diameter and with a foul but even base. In the larger ulcers the outline is irregular, though the edges are still sharp while it is spreading, but as it penetrates into the deeper tissues the floor becomes uneven, fungating at one part while the destructive process goes on at another, and a thin offensive pus is continually exuding, which, if allowed to dry, forms thick adherent crusts. The ulcer may remain small or increase to several square inches in area by the coalescence of small secondary ulcers round it. After several weeks or months healthy granulations replace the unhealthy fungations and fill up the ulcerated cavity, and cicatrization takes place with central puckering and uniform brown pigmentation of the whole scar. The whole course of the disease is run in the majority of cases in from six to twelve months, hence the Persians call it "*lukkeh sāl*," or the "one-year boil." It may, however, Woolbert of Meshed says, last only three or four months or as long as two years. Even this is not the full limit, as it is not uncommon for the sore to break out again and again after it has cicatrized. Some cases show a seasonal recurrence, healing in winter and reulcerating in the summer. Recurrences may also be seen in fresh regions of the body several years after the original sore has healed, but these are probably instances of reinfection.

Uncomplicated cases do not lead to any serious consequences, except from the disfigurement of the face or crippling of the limbs, which may arise from the contraction of the cicatrices. If, however, extensive ulceration occurs in constitutions broken down by other diseases, leprosy for instance, or if there is erysipelas or lymphangitis with glandular enlargements, the results will be proportionately

grave. As a rule, however, the lymphatic glands in the neighborhood of the ulcer do not enlarge, but the lymphatic vessels are implicated and form small nodules beyond the ulcer.

Diagnosis.

The features of the disease are very distinctive and there ought to be no difficulty about its recognition in districts where it is known to be endemic. The occurrence of an ulcer on the face or other exposed part which began as a papule, developed into an exuding nodule, over which there was a crust of dried secretion and underneath this went on a process of disintegration, resulting in the ulcer, make up a group of symptoms which finds no parallel except in *yaws*, in which also there are papules developing into fungating nodules; but in the latter case the process is much more rapid, the epidermis is separated in a few days, and the whole eruption is developed in from two to four weeks, while the boil nodule may remain unchanged for months.

Moreover, in yaws multiplicity of lesion, and that too in crops, is the rule, in Oriental boil it is the exception. Both the diseases attack the face and extremities, but while yaws has a marked tendency to attack the palms and soles, the backs of the hands and feet are the most favored positions of the boil. On removing the crust of a yaws lesion, a moist tumor is seen, while there is only an ulcer in the boil.

Yaws tumors involve only the papillary layer and when the growths dry up and fall off no scar results; the boil ulcer, as already shown, goes deep and leaves bad scars. Yaws is preceded by constitutional symptoms of a febrile character, while there are none in Oriental boil, which is a purely local affection. Further, yaws is chiefly a West Indian disease, except the Ceylon variety, while the boil is chiefly East Indian and is unknown in the West Indies. Finally, yaws almost exclusively attacks the colored races, while the boil has no racial predilections.

Etiology.

It is most common in children over two years, but no age, sex, or race confers exemption if a person be exposed to infection, although newcomers into a district are less vulnerable at first. It is most prevalent in summer and autumn in subtropical climates, and in the first part of the cold season in the tropics. The accumulated evidence is in favor of the water of the district being the vehicle of the infective organism, inoculation taking place through some scratch or

other trifling lesion during washing or bathing; for the affection has been demonstrated to be inoculable, and possibly flies are frequently the agents of its transference from one patient to another.

Pathology.

While there can be little doubt that the disease is an infective and destructive inflammation due to an organism, probably of the nature of bacilli or micrococci, the identification of the organism has baffled numerous observers, the researches of one set having been offset by those of another, and no organism which could reproduce the disease has as yet been isolated. Geber's view, formed after investigation at Aleppo, is that there is no such disease, but that all kinds of ulcers, syphilitic, tubercular, etc., are mixed up together and considered to be *the* ulcer of the district. Making due allowance for such errors, which are doubtless frequent enough, there is good evidence that there is a genuine endemic ulcer.

Prognosis.

The prognosis of uncomplicated cases is good as far as the healing of the ulcer is concerned, but the old ulcers sometimes break down again and the patient is not rendered immune from fresh inoculation.

Treatment.

If seen early enough, when there is only a red papule, the actual cautery is recommended to destroy the whole growth, or subcutaneous injections round the nodule of 1:40 carbolic acid may be employed.

When the whole has ulcerated, Woolbert's plan is a good one: Scrape away the unhealthy granulations with a sharp spoon and apply nitric acid freely or strong carbolic acid. Other caustics, such as the fuming acid nitrate of mercury, may be employed for the same object—viz., to destroy the whole of the diseased tissue—otherwise disappointment results. When once a clean surface is produced, the treatment for any ordinary simple ulcer is sufficient. Boric acid lint, wetted and cut to the exact area of the wound and covered with oiled silk, or the classic lotio rubra or black wash, may be applied in the same way. Corrosive sublimate solution 1:2,000 has been successfully employed without previous destruction of the ulcer.

The avoidance of the infected water, either externally or internally, unless it has been boiled, is an obvious precaution against infection,

though G. Ranking, a recent writer of experience, agrees with the old view of Tilbury Fox and Besnier, that the disease is of malarial origin and that large doses of arsenic or quinine render the ulcer amenable to the simplest local treatment. Even if this were true it would not show conclusively that the disease was malarial, as a specific microbe other than that of malaria might be killed by these drugs; and other substances which are microbe destroyers in the circulation, such as salicin, might be equally successful.

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GANGRENE OF THE SKIN.

Whenever the circulation in a portion of the true skin is entirely cut off, gangrene of the part which has lost its blood supply is the inevitable result.

This interference may be due to (1) causes within the vessel as in embolism or thrombosis; (2) changes in the wall of the vessel, as in acute arteritis, syphilitic or bacterial; calcareous degeneration, especially the primary form of old age; contraction of the muscular or other coats which may be acute and spasmodic, as in the symmetrical gangrene of Raynaud, or chronic, as in ergotism; and lastly, trophic changes, as in acute decubitus; (3) pressure on the vessels from without, either from inflammatory effusion round the vessels or from tumors or other causes of mechanical obstruction.

The cases of acute arteritis are frequently bacterial, as in noma or the dermatitis gangrenosa infantum.

The most important forms of gangrene are symmetrical gangrene or Raynaud's disease, which is described among the neuroses of the skin; noma, which is described in surgical works; dermatitis gangrænosa multiplex with the important infantile variety; zoster atypicus gangrænosus, the so-called spontaneous gangrene of hysterical women; and phagædena tropica.

Dermatitis Gangrænosa Multiplex.

Dermatitis gangrænosa multiplex includes gangrene of the skin in multiple foci whether adult or infantile. The latter is by far the most frequent and important and to a large extent requires separate discussion. It is known as dermatitis gangrænosa infantum.

Dermatitis Gangrœnosa Infantum.

Synonyms.—Varicella gangrænosa (Hutchinson); pemphigus gangrænosus (Whitley Stokes); rupia escharotica (Fagge); Ecthyma térébrant (French authors).

This is a gangrenous inflammation of the skin with numerous lesions, which occurs as a complication of varicella and other pustular eruptions in young children. Clinically gangrene of the skin may be seen as an accident, so to speak, in many inflammatory skin affections, the foci of necrosis being in these cases few in number. Among the principal forms are those occurring in erythema induratum, herpes zoster; in pityriasis rubra over points of pressure (rare) such as over the scapulæ, sacrum, thighs, etc.; in hemorrhagic affections, as in purpura, scurvy, erythema purpuricum; and it is an essential feature in malignant pustule and zoster atypicus gangrænosus of Kaposi, which will be more fully alluded to.

In 1809 Whitley Stokes described an "epidemic of pemphigus gangrænosus" in Ireland which evidently belongs to the disease under consideration, and the specimens in Guy's Museum described by Hilton Fagge under the title of "Rupia Escharotica" also have the same characters. But Hutchinson was the first to clearly differentiate it and to show its relationship to varicella first and subsequently to vaccinia, while the author of this article was the first to show that other non-specific diseases might also give rise to precisely similar lesions. Barlow, Warrington Haward, Payne, Campbell Williams, and others have contributed valuable cases and observations.

Whatever may be the primary condition, the lesions have ulti-

mately similar characters, but the place of onset and mode of development differ in relation to varicella according to whether it appears early or late in that disease or is independent of it. In cases not due to varicella, or when the affection occurs as a sequel to varicella after most if not all the varicella lesions have cleared off, the gangrenous ulcerations usually commence on the lower half of the body, especially about the buttocks and thighs.

A pinhead-sized papulo-pustule forms, which enlarges to the size of a pea or a bean, ruptures and dries to a scab, in the centre around which is a narrow pustular ring, while the whole is enclosed in a bright-red areola, the entire lesion resembling a vaccinia pustule. The morbid process extends peripherally and vertically until a black slough is formed from a quarter to one inch in diameter, the small lesions preserving the pustular border. When the full development is reached, varying in different lesions, separation of the dead tissue commences and the whole sloughs out, leaving a sharp-edged conical ulcer with a roundish or oval outline, the depth being in proportion to the diameter, the largest being sometimes an inch deep. As a rule, the ulcer does not extend after the slough has separated, but when several lesions are close together they may soften and coalesce into a gyrately outlined ulcer, perhaps of formidable dimensions with an irregular floor.

When the gangrenous change sets in early in the course of a varicella—while, therefore, the varicella vesicles are still present—it usually commences on the head or upper portion of the body and then ulceration proceeds beneath the varicella seat, round which a pustular ring is often formed at the margin of the scab with a red areola round it, and the vaccinia-like lesion before described is produced; the course is then similar to that already described.

The deepest ulcers are usually those about the buttocks and thighs, especially where the napkin comes, and they are also most numerous here, while on the trunk and rest of the body they are comparatively sparse and superficial, although they may be of considerable diameter. Of course deep ulcers may sometimes occur on the trunk. The constitutional disturbance is in proportion to the number and depth of the lesions. In extreme cases the temperature may go up to 105° F. or more; lung complications are then likely to ensue of tuberculous, pyæmic, or inflammatory origin, the child rapidly sinking as early as three or four days from the onset of the gangrenous change. Pyæmic infarcts and abscesses are very often found in the lungs, with more or less bronchopneumonia. If the deep lesions are only few in number, the child will survive and the ulcers will cicatrize with remarkable rapidity, leaving deep scars which may be

more or less pigmented. In Haward's case, which was fatal in four days from the onset, hemorrhage into the vesicles occurred and turned them all black within twenty-four hours.

At the other end of the chain are cases of varicella with skin sequelæ in which the nature of the changes in the skin would not be recognizable were it not for the connecting links supplied by cases of intermediate severity. These mild cases are much more common than the fatal gangrenous ones, which are fortunately rare, and almost confined to early infancy. Thus the ulceration may not go beyond the vacciniform stage, remaining superficial and then drying up, perhaps having never gone beyond excoriations, or it may progress to rather deep ulceration, but stopping short of actual gangrene, or again, while the majority are superficial one or two may be gangrenous. Sometimes clear bullæ are the leading features, not necessarily in connection with varicella; the contents become pustular and some may ulcerate but without the formation of sloughs.

A still milder form occurs only in connection with varicella and was called "varicella prurigo" by Mr. Jonathan Hutchinson, who first described it. In this variety papules and pustules appear in crops and recur for weeks or months, being accompanied by severe itching but not by any ulceration.

In those cases which are connected with vaccination the ulcers and sloughs do not commence in the vaccinia lesions, though they usually first appear on the vaccinated arm. The development and course are the same as those due to varicella or other causes, and the lesions may be of any grade of severity.

In a case published by Atkinson, of Baltimore, the ulcers were chiefly on the extremities, with extensive ulceration of the face, mouth, and tongue, and destruction of the soft parts of one finger. The child recovered.

Dermatitis Gangrœnosa Adultorum.

Precisely similar cases to varicella gangrænosa are said to occur sometimes in variola in adults. But as a rule adult cases are not quite identical either in their etiology or course, although in their general character the individual lesions resemble those of infantile form. They are still rarer than the latter.

The most important is the form which occurs in connection with *diabetes mellitus*. Kaposi and others have described a bullo-serpiginous form of gangrene which sometimes occurs in successive crops on the limbs of patients far advanced in diabetes mellitus. The bullæ dry in the centre into a scab enclosed by a ring of pus, and the lesion follows the course already described in gangrene from other causes.

The gangrene of the extremities of diabetics, such as the sloughing off of a finger, toe, or penis, belongs to a different category and is probably due to obliterative arteritis.

In a case seen by the author with his colleague, Mr. R. Parker, an analogous gangrenous change occurred in a bullous eruption which began as hydroa herpetiforme and was aggravated by the administration of iodide of potassium into hemorrhagic bullæ, which ruptured and developed into extensive sloughing ulcers. The patient was a girl of twelve, and the case is only described as presenting an analogous but not identical condition with the preceding form of gangrene.

Two cases in adults of an analogous character have come under the observation of the author: one was that of a woman, aged forty, who, since she weaned her last hildc, fourteen years previously, had been subject to abscesses about the vagina. After one of these a gangrenous spot, like those above described in children, appeared on the inner side of the left knee, and then others invaded successively every region of the body, and all stages of the eruption could be traced at once, the most recent being small shotty papules crowned with a vesicle which soon became a pustule and dried into a scab, and then a slough formed with a pustular ring which spread as before described. When almost well another attack occurred, with febrile disturbance, involving the face chiefly and producing great disfigurement. In a third outbreak she had ulceration of the soft palate, and scattered pustular lesions of the skin so suggestive of syphilis that mercury was given. The lesions healed comparatively rapidly, but there was no other evidence of syphilis and her husband and three children were quite healthy. She suffered from xerostoma and had lost all her teeth at the age of thirty. She got quite well of the skin lesions but was much scarred.

The second adult case was in a man whom the author saw with Dr. Barlow, under whose care he was at the London Fever Hospital. The patient, aged twenty-one, was recovering from scarlet fever when gangrenous sores developed from irregular groups of bullæ on the elbows and knees, and in the mouth. He had had albuminuria but had recovered. No doubt similar cases to the above occur from time to time but are not recorded or have escaped the notice of the physician. In elderly persons multiple gangrene from obliterative arteritis may be occasionally seen, as in a case reported by Rothmann.

Etiology.

Excluding the adult cases mentioned, which are clinically not quite the same as the children's cases, all have occurred in infants or quite young children. Thus fifteen out of twenty-seven cases were under

one year, the youngest being eight months old, and all the rest except one were under three years; a very large proportion were of the female sex. Varicella is undoubtedly the most frequent antecedent, equalling all other forms of eruption put together. In the cases in the practice of the author, vaccinia comes next but far behind. As some cases developed on other eruptions, as, for example, in what appeared to be so trivial a disease as miliaria, it is probable that it may supervene on any form of vesicular or pustular eruption under favorable circumstances.

Those circumstances are first infantile life. Tuberculosis, as Barlow first demonstrated, is an especially frequent concomitant, but rickets and congenital syphilis have also occurred, and in C. F. Marshall's case, aged four years, the gangrene developed in the course of typhoid fever. Since a febrile condition has been present in nearly all cases, possibly this is the only essential factor, and the constitutional conditions mentioned are factors only in so far as they conduce to a rise of temperature. The patients, as a rule, have not been cachectic. The adult cases are too few to generalize upon, diabetes mellitus being the only disease which has been of such frequency as an antecedent that it can be looked upon as an important factor.

Pathology.

While it is highly probable that the gangrene is due to a microbic infection invading the organism through the varicella or other vesicular or pustular lesion, this has not yet been proved. Ehlers, of Copenhagen, found the Bacillus pyocyaneus in two cases of "ecthyma térébrant." Oettinger found the same organism in a case of pemphigus diphtheriticus with a gangrenous aspect, and Neumann, of Berlin, in a case of cutaneous and internal hemorrhages. Perhaps the difference of lesion depends on the patient's condition at the time, or on the mode of entrance of the organism into the body. More evidence is obviously required before this bacillus can be accepted as the pathogenic agent.

Diagnosis.

The presence of multiple gangrenous lesions accompanying or following varicella or other vesico-pustular lesions in a child precludes any error of diagnosis. The milder forms of lesion are less obvious, but equally recognizable from the following characteristics: Deep ulcers in a young child, each of which developed from a pustule, which dried in the centre into a scab enclosed by a ring of pus, and, the whole lesion having spread both in depth and area, the ulcer was left when the scab separated.

Prognosis.

This in the infantile cases depends on the age of the patient, the youngest being the worst, the number, extent, and depth of the lesions and the consequent constitutional disturbance, and the presence or absence of tuberculosis, pyæmia, or septicæmia. In adults, although the number and depth of the lesions are of some significance, the general condition of the patient is the most important—*e.g.*, when diabetes mellitus of long standing is present—the gangrene being rarely sufficiently extensive to be fatal of itself.

Treatment.

This must be general and local. The *general treatment* must be directed towards supporting the patient's strength, together with the administration of drugs which have a presumably antimicrobic action on the blood. Of these, quinine has the advantage of being also a nervine tonic, and to infants two grains may be given in milk every four hours. To adults five- or even ten-grain doses may be given in an effervescing mixture of citric acid and bicarbonate of potassium, the quinine of course being dissolved in the acid portion. Salicin in twenty- to thirty-grain doses might also be tried. In some of the author's infantile cases, five grains of sulphocarbolate of sodium every four hours seemed to be beneficial, and in one severe case, reported by Coutts, recovery took place under treatment by opium.

Complications would of course modify the treatment according to their character.

Local Treatment.—Before the sloughs have separated, if they are not too numerous, wet boric-acid lint covered with oiled silk assists their separation. When very numerous, changing wet dressings is painful, and a soft antiseptic ointment spread on lint would be more easily changed. Iodoform gr. xx., vaseline ʒ i., would be a suitable application. Loretin is a similar application and less objectionable as regards odor. These can be continued after the sloughs have separated. Freshly made iodide of starch paste thickly painted on and covered with lint and oiled silk is also valuable, and a warm solution of chlorinated lime on lint answered well in one case. Careful feeding with meat juice and other concentrated foods, with peptonized milk for infants and meat for older patients, is also a valuable aid in keeping the patient up while the process is coming to an end.

Spontaneous Gangrene; Hysterical Gangrene; Zoster Atypicus Gangrænosus et Hystericus.

Under these names cases from time to time have been described which, while presenting points of difference in many respects, have also not a few points of resemblance, and it is doubtful whether there is any advantage in separating them.

It has already been mentioned that in a few cases of herpes zoster the inflammation is so intense as to produce actual gangrene of a portion of the skin, generally corresponding with the area of a vesicular group or even of a single vesicle. This is most frequent when the ophthalmic division of the fifth is involved in an elderly person, in whom sometimes extensive sloughing occurs, but it may also happen in an ordinary intercostal herpes in a child.

In 1889 Kaposi described as zoster atypicus gangrænosus three cases, and a doubtful fourth, which he considered to belong to the zoster group, in which gangrene was the rule instead of the exception. The cases differ, however, in not being distributed in any definite nerve areas or area; in occurring at any part of the body and on both sides; in not running a definite course, but by repeated attacks at irregular intervals continuing for an indefinite period. Indeed, the sole ground for being referable to zoster is that the lesions commence as groups of vesicles in neurotic subjects. In all the cases the main features were an eruption of vesicles and papules, chiefly in groups, followed by central scabbing, which was often surrounded by a ring of pus or minute pustules. Coalescence sometimes took place and large areas of gangrene were thus produced, and keloid often followed the healing process. The eruption was symmetrical, did not show any definite nerve distribution, and the period of development occupied from four to eight days, and then improvement set in. Recurrences took place in all the typical cases of Kaposi. In a case recorded by Joseph, in an hysterical girl of fifteen with albuminuria, there were eight attacks in two months, and she had numerous scars of previous lesions. Kaposi's three typical cases were also in hysterical women, and similar cases have been described by other observers.

One of the most remarkable was that of Doutrelepont, who observed the case for five years to its fatal termination by phthisis. The patient was an hysterical girl of twenty-one and a trifling injury under the nail was the immediate antecedent. The day after the injury small gangrenous spots appeared on the back of the left hand, subsequently the whole limb and left side were successively attacked, and two months from the commencement the right side also, and

later the head and face. There were sometimes intervals of a month or two of freedom. Each outbreak was preceded by a rise in temperature and painful pricking in the affected region, and then whitish-gray lesions appeared made up of a group of smaller rounded lesions—herpetiform groups in fact—but there were never any vesicles or other elevated lesions visible to the naked eye, although microscopical observation showed that there were inchoate vesicles which, owing to the rapidity of the process, did not develop. The resulting lesions were always superficial, but most of the scars became keloidal except when the wounds were dressed with corrosive sublimate. At a later period, however, vesicles and bullæ did sometimes precede the gangrene, though sloughs without vesicles were the rule. The mouth also became involved about the end of the third year. Attacks became more and more frequent, no region of the body escaping, mental changes, with great excitement, alternating with depression, occurred and led to suicidal attempts, and ultimately the patient died from phthisis five years from the onset of the attacks of gangrene, which had, however, diminished towards the end.

Other cases in hysterical women have been recorded by Bayet, H. Hebra, Schwimmer, and others. In some of them the vesicular commencement was absent, but as the course of Doutrelepont's case shows, their absence at one period of the disease does not constitute an essential difference. Joseph, Bayet, Kaposi, and Quinquaud have also recorded somewhat similar cases in neurotic men. In most of them a slight injury preceded the gangrenous lesion, which did not, however, occur on the site of the injury.

When we sum up the features of these cases as a whole, it will be noted that all the women were young and hysterical, and the men were also generally described as neurotic and hysterical. Rothmann's and Hallopeau's cases occurred in older women, but do not seem to belong to the same class as those above described. It will also be noted that in the group under consideration a large proportion seem to have dated from a traumatism.

While in the face of so many cases recorded by skilled observers it cannot be maintained that this so-called hysterical gangrene is non-existent as a true disease, the possibility of imposture must always be borne in mind, and there are several instances on record in which cases first reported as instances of disease were subsequently proved to be self-induced. Such was Sangster's case of neurotic excoriation and Erb's case of hysterical gangrene. The latter was proved to be produced artificially by means of caustic potash, and by varying the duration of the application of the caustic it was possible to produce erythema, wheals, herpetiform vesicles, and bullæ. The

antecedent traumatism, which was a frequent feature in the above supposed genuine cases, has been assumed to be the starting-point of a neuritis; but it must be remembered that in many cases of proved imposture an accidental injury has suggested to the hysteric the self-infliction of subsequent lesions. It will be noted that no treatment has appeared to prevent the recurrence of the gangrenous process.

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PHAGEDÆNA TROPICA.

Synonyms.—Tropical phagedenic ulcers; Aden ulcers; Malabar ulcers.

French surgeons serving in the colonies, especially Cochin China and Tonquin, have contributed most of our knowledge of this scourge of malarious tropical climates, and Parke, who was in Stanley's Emin Pasha expedition in Central Africa, is one of the most recent writers on the subject.

Description and Course.

It is met with in all tropical climates from East to West. Cochin China, Tonquin, the islands and shores of the Red Sea, Central Africa and Central America, Madagascar and the Mozambique are its special homes, but it has reached as far north as Algiers and Egypt.

The chief victims are those broken down in health from malaria, privation, or over-fatigue, and then the smallest breach of surface affords an opportunity for inoculation with the bacillary organism, which is almost certainly the cause of the disease.

Two forms, a mild and chronic, and an acute and severe form, are met with. Both may start from a trivial lesion, traumatic or inflammatory, and the process either proceeds directly from the previous lesion, or an abscess, vesicle, or bulla may first form.

The Mild Form.—Boinet, from the record of whose observations in Tonquin most of this article is derived, distinguishes three stages: (1) The period of onset and establishment of the phagedena; (2) the period of atonic ulceration; and (3) that of repair.

The part affected becomes red, painful, swollen, and excoriated from scratching, and there is a serous or sanious discharge. The edges of the sore place become swollen and indurated, and are surrounded by a dusky red areola. The lesion spreads laterally and vertically by a molecular disintegration, which eats away the borders and surface and forms an ulcer with an irregular floor covered with a grayish slough bathed in yellowish or sanious pus. The slough is separated after a time and the activity of the inflammation diminishes, the ulcer gets paler, but the floor remains covered with a putrid pultaceous layer and the ulcer may remain stationary, the pain gradually ceasing. The onset of the second period varies, depending on the general condition of the patient and the position of the ulcer, and is marked by the extension of the sore, both vertically and laterally, with punched-out borders, which subsequently become indurated and

dressings, would probably obviate in most cases the necessity of scraping, of the actual cautery, or of strong caustics recommended by the French writers for severe cases.

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DISEASES

OF THE

SEBACEOUS GLANDS.

BY

ARTHUR VAN HARLINGEN,

PHILADELPHIA.

DISEASES OF THE SEBACEOUS GLANDS.

Like the affections of the sweat glands, those of the sebaceous glands may be grouped under two general divisions.

A. Functional Disorders.

B. Structural Disorders.

FUNCTIONAL DISORDERS.

The functional disorders of the sweat glands may be subdivided into several classes: (1) Affections in which the secretion of the gland is extruded upon the surface of the skin in the shape of scales or greasy crusts, or is poured out in the form of an oily fluid—*seborrhœa.* (2) Affections in which the sebaceous secretion is diminished in quantity—*asteatosis.* (3) Affections in which the secretion of the gland is not eliminated but collects in the gland or its duct—*comedo, milium, sebaceous cyst.*

Seborrhœa.

Seborrhœa, strictly speaking, is an affection of the sebaceous glands characterized by an increased flow of their secretion. If we confine ourselves to this definition, however, we shall bar out a number of affections which have been and are still included under the head of seborrhœa by some writers. On the other hand, there is a tendency at present to confine the term seborrhœa to such strict limit as almost to extinguish its existence.

In the following article the older classification of seborrhœa will be followed, but with the addition of such explanations as shall give some idea of the views prevalent among dermatologists of the present day.

Following Brocq we divide seborrhœa into two great classes:

1. Seborrhœa of the hairy parts of the body;
2. Seborrhœa of the smooth parts.

Seborrhœa of the Hairy Parts.

This may be divided into four varieties. (1) Dry seborrhœa; (2) concrete seborrhœa; (3) oily seborrhœa; (4) circinate seborrhœic eczema.

Seborrhœa sicca, or dry seborrhœa, is in reality a pityriasis.

So long ago as 1876 ("A Contribution to the Pathology of Epithelium," *American Journal of the Medical Sciences*, July, 1876), I had undertaken certain microscopic investigations with the view of getting some practical aid in the differential diagnosis between seborrhœa, psoriasis, and eczema as these affections are found occurring in the scalp (I refer, of course, to the dry form of seborrhœa and the squamous form of eczema). The result of these investigations went to show that the "seborrhœa sicca" of Hebra is in reality a pityriasis, the product of disease being purely horny epithelial cells.

In a later communication ("The Pathology of Seborrhœa," *Archives of Dermatology*, April, 1878), I pointed out that certain forms of disease heretofore commonly classed as seborrhœa sicca should properly be removed from the category of diseases of the sebaceous glands, since the pathological product in these cases is not sebum but epithelium from the horny layer of the skin. Any sebum which may be present is a mere accompaniment of the epithelial product. For these cases I suggested the retention of the designation of pityriasis, or pityriasis simplex as most appropriate.

Later Unna, in a series of excellent papers based upon careful investigations, proved the facts which I with the imperfect means which I had at my disposal had dimly perceived, and established eczema seborrhœicum as an entity. When, therefore, I still use the older term I am understood to refer to Unna's eczema seborrhœicum, in some of its forms at least.

Seborrhœa sicca, pityriasis capillitii, or eczema seborrhœicum capitis is characterized by an eruption composed of dry, fine, furfuraceous scales sometimes slightly greasy, more or less abundant and adherent, and which cover the hairy scalp, from which they are constantly shed in considerable quantity. The scalp itself beneath the scales often has an almost healthy appearance and preserves its normal color. Sometimes it is slightly œdematous or less mobile on the pericranium than usual. The lesions are almost always accompanied by a more or less considerable falling of the hair and sometimes with considerable itching. The patient scratches his head and causes the fall of numerous scales which are, however, rapidly renewed. In most cases there is no sign of inflammation excepting such as is the result of scratching.

Seborrhœa sicca is often complicated by premature alopecia. Pincus calls it "alopecia pityrodes."

Concrete seborrhœa, or greasy crusts of the scalp, is the second type of seborrhœa. The affection is made up of epithelial flakes mixed with a considerable quantity of sebum forming a mass of scales, or, rather, of a sort of crusts, of a dirty yellowish, greasy appearance, more or less dry or moist, of a color varying from grayish-white to deep brown and adherent to the scalp, which may show underneath a reddish, moist surface.

This variety has a tendency to encroach upon the neighboring parts of the scalp about the temples, etc., and may pass a third of an inch beyond the edge of the hair with a sharply defined border. All forms of transition between this and the previous variety are met with, from the dry form with scarcely any loss of hair to the moist forms with congestion of the scalp, which may be regarded as a transition type between the second variety of seborrhœa and the third, which will be described a little later. This second type was called *acné sebacée concrète* by the older French authors, and the name is still preferred by Besnier. It is the intense form of the seborrhœa sicca of Hebra. According to Unna it is erroneous to attribute the disease to an exaggerated secretion of the sebaceous glands. The fatty matter of the crusts, according to this author, proceeds from the sudoriparous glands.

Seborrhœa oleosa, or as Brocq prefers to call it, "oily hyperidrosis of the scalp," shows itself on the scalp and almost invariably also at the same time on the face, by a layer of oily, greasy matter in greater or less abundance. The skin is more or less red and congested. This type is the *fluxus sebaceus*, the *acné sebacée fluente* of the older French writers, the *acné sebacée liquide* or *huileuse* of Besnier, the *seborrhœa oleosa seu adiposa* of Hebra and Kaposi. There is always in these cases some exaggeration of the function of the sudoriparous glands of the scalp and forehead, which are dilated and gaping. As the secretion is so abundant that after drying the surface, droplets of fluid are seen standing out, this form of so-called seborrhœa has been termed by Brocq, very properly I think, *oily hyperidrosis of the scalp.*

Circinate seborrhœic eczema of the scalp. This morbid type is characterized by the appearance of greasy scales or crusts arranged in circinate or figurate forms, resting upon a red derma, sometimes dry but more frequently moist, occasionally oozing and seated upon the summit of the scalp when alopecia exists. Almost invariably it coincides with a similar eruption occurring upon the trunk, between the shoulders and over the sternum. This is the dermatosis which in America has been known by the name of *seborrhœa corporis*. Wilson

called it *lichen annulatus serpiginosus*. It is a cutaneous irritation resulting from the accumulation upon the skin of epidermic scales, products of the cutaneous glands and numerous parasites. It will be described later under the head of Seborrhœa of the Smooth Parts.

Alopecia is observed in all four of the varieties of seborrhœa which have been described. It does not appear to originate at the same time with the seborrhœa, but follows it after a longer or shorter period. In the first two forms, which are the most frequently met with, two stages of evolution may be observed. In the first there is more or less abundant desquamation, the hairs are dry, thin, and gradually fall out. The duration of this stadium varies, according to the subject, from one to ten years. Then in the second stage, the hairs fall rapidly, they become more and more fine and thin until, as in premature idiopathic alopecia, there remains only a downy growth which in its turn vanishes. The aspect of the scalp and the localization of the baldness are the same as those observed in premature idiopathic alopecia, with which affection in fact the present disease is often intercurrent. These two forms particularly affect men between the ages of twenty and thirty-five years.

Occasionally these forms of seborrhœa are observed in women, and particularly in young women from fifteen to twenty-five years of age, and in these cases also the affection is accompanied by a falling of the hair. The alopecia in the case of women is less rebellious to treatment than in the case of men, and in some cases it may be completely cured. The disease affects at times the eyelashes and brows, and may give rise to the most stubborn alopecia.

Seborrhœa of the scalp may be complicated by various other affections. It occasionally occurs in connection with alopecia areata, which then presents a tenacity and a tendency to relapse which is highly characteristic. Occasionally it is said that keratosis pilaris may complicate seborrhœa. I cannot recall having met any cases of the kind and I think that the two affections are essentially antagonistic.

Brocq says that it is not rare to find in the case of persons who appear to be the victims of seborrhœic alopecia, certain white cicatrices, irregular in form and aspect, around the edge of which the scalp appears to be slightly depressed and as if slightly atrophied. In the neighborhood of these smooth, irregular islets—which furrow up, so to speak, with their prolongations and ramifications all the anterior and superior portions of the scalp—scanty tufts of irregular frizzled thin hairs can be seen which seem to emerge from or to be surrounded by small elevations of a papular character, somewhat resembling the elevations of keratosis pilaris. Brocq has observed this

condition in a number of cases, and it has occurred to him that this variety of pseudo-seborrhœic alopecia is one of the forms of destructive keratosis pilaris of the scalp, *alopécie cicatricielle.*

Seborrhœa of the Smooth Parts.

Seborrhœa sicca of the smooth parts is characterized by a simple desquamation, more or less abundant in quantity, sometimes pityriasic, sometimes greasy, grayish or yellowish, and slightly adherent to the skin.

Some authors have described under the head of *generalized dry seborrhœa* a sort of xerodermic condition observed particularly in persons of degenerate organization (tuberculosis, profound anæmia, cancer, etc.), and which is connected with a marked dryness of the integuments due to a suppression of the functions of the cutaneous glands. Such a designation as seborrhœa is highly inappropriate, as it seems to me, to denote an affection characterized by a suppression of the sebaceous secretion.

It is possible, however, that some of those hitherto imperfectly described eruptions to which the names of "pityriasis simplex," "dry eczema," etc., have been applied and which are frequently found in patches upon the cheeks, nose, etc., should be included under the designation of seborrhœa sicca, that is, the first variety of eczema seborrhœicum. Brocq gives the name *pityriasis simplex* to this affection provisionally, a term I am inclined to accept, for the present at least, until the exact limits of Unna's eczema seborrhœicum have been further defined and settled.

Seborrhœa concreta, or as Brocq prefers to call it, *oily crusts of the smooth parts*, may occur under two aspects: (*a*) It may either involve large surfaces without strictly defined limitations, or (*b*) it may be limited and sharply circumscribed.

In the first variety, the affection is seated particularly upon the nose and cheeks, more rarely upon the lips, the chin, the brow, the eyelids, the ears, the umbilicus, the genitals, the larger articular folds, etc.

Occasionally, says Brocq, young girls in particular may be observed to have the entire figure covered with a sort of crusted mask of a dirty brown, a grayish or blackish-brown, composed of more or less thick layers of sebaceous matter resting upon an oily skin and reforming with great rapidity when removed. This coating gives a very decided feeling of oiliness to the touch.

The integuments are often red, tumefied, and sensitive to pressure. Patients experience a sensation of burning heat or of itching. Some-

times certain regions, as the lips, become really painful, fissured, and highly inflamed. Sometimes also this form of seborrhœa becomes complicated with eczematous irritation. In fact, it is difficult to draw the line between this form of seborrhœa and eczema seborrhœicum.

The circumscribed form of seborrhœa concretum occurs in two varieties. Sometimes there are grouped papillary lesions, forming when associated disc-shaped patches, the dimensions of which vary from that of a pea to that of a quarter-dollar, rounded, flattened, rising slightly above the surrounding integuments and covered with a coating of somewhat adherent sebaceous matter of a yellowish-gray, brownish, or blackish color. These are the lesions called *verruca plana seborrhœica* of the aged, on account of their frequency in old people. Well-defined cases are, however, met with in the young. These lesions are ordinarily very numerous upon the neck and trunk. According to Pollitzer they may, from an histological point of view, be assimilated with the lymphangio-fibromata of Recklinghausen, a group which includes the greater number of pigmentary nævi. Of course such lesions would better be considered under verruca, but in order to give a comprehensive view of the seborrhœas, I have included them here.

In the second variety of the circumscribed form of seborrhœa concretum of the smooth parts, the affection shows itself in the form of red patches, situated on the face towards the eyelids, on the lateral or superior portions of the nose, on the temples, etc. They are limited by sharp borders and are covered with greasy crusts more or less thick, under which the derma is friable and bleeds easily. These are the lesions to which the name *acné sebacée concrète* has been given. Brocq thinks these often constitute the first stage of superficial epithelioma, the "carcinoma seborrhœicum" of Volkmann. It is somewhat comparable in this respect with Paget's disease of the nipple.

These greasy crusts with the prolongations on their lower surface, penetrating the dilated orifices of the derma, may also be met with in certain forms of lupus erythematosus, particularly at the beginning of the disease. It is even difficult at this date in some cases, in presence of a similar lesion, absolutely to decide whether there is a commencing epithelioma or a lupus erythematosus. It would seem, says Brocq, that this is a sort of indifferent lesion which has the potentiality of development either in the direction of lupus or in that of epithelioma, according to the age or aptitude of the individual.

In conclusion, it must be admitted that circumscribed concrete seborrhœa is a morbid process and product which has little in common with the various forms of true seborrhœa.

Seborrhœa oleosa, or *hyperidrosis oleosa of the smooth parts*, is that

variety for the relief of which the physician is most frequently consulted. It occurs ordinarily about the nose and cheeks, but it may also invade the other regions of the face. The parts affected often preserve their habitual color, and the disease is displayed only by a dilatation, visible to the naked eye, of the glandular orifices, and by the incessant formation of an oily coating upon the integument which soils linen or paper like grease. It is not unusual to see, especially on the nose, the signs of slight inflammation, redness, and swelling. Frequently the affection is complicated with varicosities, and acne, comedo, etc., are usual accompaniments.

The two latter varieties of seborrhœa which have been described are at times met with upon the genital organs.

In males, when there is a long prepuce, balanitis may supervene. In females the greater and lesser labia are affected and the neighborhood of the clitoris, giving rise in some cases to inflammatory symptoms, pruritus, burning, and discharge.

Seborrhœa corporis gives rise to a variety of symptoms, and its nature has been even more a matter of discussion than the other affections described under this name. It is usually seated upon the chest anteriorly and between the shoulders posteriorly, more rarely in the groins and other large folds of the skin. Its maximum intensity is almost invariably found towards the median line. From thence it spreads towards the lateral regions to a greater or less distance according to the severity of the process. The affection shows itself at first in the form of small circinate lesions, frequently perfect circles, of a pale rose or bistre tint and slightly squamous in the centre, with sharply circumscribed borders like a fine reddish deposit, with occasionally lines of minute papular or papulo-squamous lesions in the neighborhood commonly more or less excoriated by scratching. The eruption, Brocq says, is decidedy pruriginous, but I have seen a great number of cases where no signs of scratching could be perceived and in which the patient has experienced no pruritus. In fact, I have sometimes pointed out to the patient for the first time the existence of these lesions previously unsuspected.

The smaller lesions grow gradually by extension, always preserving their sharply marked outline, slightly elevated and scaly. In well-marked cases the circular form is gradually lost by the disappearance of one edge while the other is extending, and then by the interference of circles and segments of circles the affection takes on strangely gyrate and figurate aspects, making the appearance of the skin map-like and highly striking. The centre of the larger patches becomes less scaly but preserves a rose or pale-brownish tint, sometimes almost normal, while the advancing edges are slightly elevated and scaly.

The more extensive the eruption is the more likely is it to be pruriginous, and in some cases there are attacks of pruritus coming on at certain hours of the day, usually in the evening when the patient is undressing. Flannel underclothing acts as a peculiar excitant to pruritus in such cases, so that the disease has sometimes been called the flannel eruption.

Seborrhœa corporis usually coexists with other forms of the disease, so much so that on seeing a well-marked seborrhœa of the scalp extending to the forehead, or even seborrhœa of the nose and cheeks, one may deduce the existence of a similar eruption over the sternum or between the shoulders or in both localities.

Diagnosis.

The diagnosis of the various forms of seborrhœa, as these occur upon the smooth parts of the body, is comparatively easy. Exception to this must be taken, however, so far as seborrhœa concretum is concerned.

At times the patches of seborrhœa concretum of the face simulate the earlier phases of lupus erythematosus or of epithelioma. In lupus erythematosus, however, the crusts are ordinarily more dry, more scaly, and more adherent. In epithelioma the subjacent tissues are somewhat indurated and friable; they bleed easily, the edges are more sharply circumscribed. Sometimes they are elevated and often present a pearly appearance. At times, however, the diagnosis is extremely difficult. Indeed occasionally the seborrhœic process precedes and leads up to the development of the new growth.

Seborrhœa of the scalp is sometimes a little difficult of diagnosis. It is of importance, however, to distinguish this affection from the other diseases of the skin which may occur upon the scalp, because the treatment to be followed is different. Tricophytosis, or ringworm, favus, and lupus erythematosus, although resembling seborrhœa capitis, need not, with ordinary careful examination, be mistaken for it. The case is different, however, when we are confronted with an affection which may be psoriasis, eczema, or seborrhœa, and when the plan of treatment to be followed will depend upon the conclusion reached as to the nature of the disease. It will be profitable, therefore, to point out some of the distinguishing features of the affections thus important to differentiate from one another.

Psoriasis of the scalp is usually characterized by an accumulation of dry, white, strongly adherent scales closely attached to one another and to the subjacent tissues, and forming little hillocks of unequal size and of a highly characteristic sort throughout the scalp. When the disease assumes this aspect it is very easily recognized. It is not

so, however, when the eruption is composed of fine, small, dry, whitish scales evenly and thinly scattered over the surface of the scalp instead of occurring in heaps. In most cases the following characteristics will aid the diagnosis:

The scales of psoriasis are more dry, more micaceous, more adherent, and more resistant to the finger nail than those of seborrhœa, which always contain more or less fatty matter. When they are scraped off they appear very white and pearly, which the scales of seborrhœa never become, or at least not to the same degree. In psoriasis the subjacent skin of the scalp is never healthy, it is discolored. The hairs are dry but do not fall out as in seborrhœa. The lesions may be disseminated over the entire scalp. Ordinarily they do not form one sheet but are arranged in patches with sharply defined edges and intervals of healthy tissue. However, this circinate and limited arrangement of the lesions is also observed in eczema seborrhœicum, but in this case the centre of the patch is very slightly infiltrated and the scales are only slightly adherent.

Almost invariably in psoriasis the eruption passes the limits of the scalp, particularly about the forehead and over the ears. This frontal border of psoriasis, when it exists, is highly characteristic (although this is also found in some forms of seborrhœa occasionally), for the contours are sharply defined, irregular, sometimes slightly circinate. The characteristic signs of psoriasis are more perceptible here than on the scalp. Finally, in the great majority of cases some distinctive patch of psoriasis is to be found somewhere on the trunk or limbs.

Eczema of the scalp is often very difficult to distinguish from the dry forms of seborrhœa capitis, particularly from that variety more properly called *pityriasis capillitii*. Sometimes the squamous eczema has been preceded by a moist stage when the history of moisture and weeping will decide the diagnosis.

The character of the scales, which are finer and more dry without in any case the slightest tinge of oiliness, will aid in distinguishing eczema of the scalp from seborrhœa, when a history of previous moisture may be wanting. The condition of the scalp itself, which in eczema is more red, more inflamed, and tends to weep under the crusts when there has been scratching, is also confirmatory of the presence of eczema. Finally, although alopecia occurs in connection with eczema, the falling of the hair is not so profuse and constant as it is in seborrhœa, nor does it so inevitably lead to baldness. In eczema the hair becomes fine and very dry, friable and lifeless, but regains its vigor when the eczema is cured; while in seborrhœa, while the hair does not change much in character, it falls out progressively and inevitably.

Etiology.

From the point of view of etiology and evolution, the various forms of seborrhœa and of seborrhœic alopecia may be divided into two groups of very unequal importance.

The first group includes those of a transitory character, following general acute diseases, temporary exhaustion of vitality of a curable nature, such as results from severe hemorrhages, anæmia, pregnancy, and certain chronic diseases as syphilis. In all these cases the seborrhœa is but an epiphenomenon without great importance; almost invariably the alopecia becomes arrested, the seborrhœa ceases, and the normal condition is restored either spontaneously or under the influence of appropriate general treatment.

The second group comprises those forms of seborrhœa which pursue a chronic course with slow evolution and which become, so to speak, fatal to the hair growth, the affection in the great majority of cases not coming to an end until the hair has entirely disappeared from the superior and middle portions of the scalp, even the downy lanugo finally falling out, leaving the cranium denuded, smooth, and polished as a billiard ball. In some cases, particularly where the seborrhœa is of the oily variety, this may persist even after the hair has completely fallen out and complete baldness has ensued. The etiology of these forms of seborrhœa has never yet been satisfactorily made out.

When the seborrhœa develops in a relatively short space of time it is usually connected with a marked lymphatic and anæmic condition. When it follows a subacute, remittent, or intermittent course, it is observed particularly in young girls or in anæmic women or those of a lymphatic-anæmic temperament. When the seborrhœa follows its usual slow and chronic course, it is, as a rule, found upon the vertex, the middle portion of the scalp, the nose, and the cheeks; it is here observed in young persons, and, according to Brocq, in adults of an arthritic tendency.

A bad state of the digestive organs, obstinate constipation, poor circulation, coldness of the extremities and flushes of heat in the face, defective or inappropriate alimentation, bad general hygiene, severe disappointments, care and constant preoccupation, overwork, intellectual or moral fatigue, excesses of all kinds, a lack of proper attention to the scalp—any or all of these numerous causes go to produce or aggravate, in persons constitutionally predisposed to seborrhœa and alopecia, the affection in its most marked forms.

It is possible also that parasitism may play a part in the produc-

tion of seborrhœa and seborrhœic alopecia. Lassar and Bishop have succeeded in inoculating the affection, and Unna and others have demonstrated the existence of numerous parasites in eczema seborrhœicum. As yet, however, the precise rôle which these organisms play in the production of the disease has not been demonstrated.

Treatment.

The general treatment of alopecia involves a careful preliminary examination of the patient, an inquiry into his personal and hereditary antecedents, the condition of the various organs, his mode of life, his general hygiene, and in particular the hygiene of the scalp. From the results of such investigations the physician may decree the proper course of general treatment to be followed in the individual case.

Fresh air and exercise, a country life, but in case of seborrhœa of the face avoidance of exposure to a cold or damp atmosphere, are to be recommended. In case of seborrhœa of the face, reading, and work in or exposure to bright sunlight or artificial light are to be avoided. Late hours and excesses of all kinds are to be interdicted and the diet should be light and easily digestible. Medication directed to imperfect or difficult digestion must be employed when symptoms of such disorder exist. When cold hands and feet are present, frictions, douches, etc., are to be employed.

In nervous or impressionable cases Brocq advises the employment of antispasmodics, especially valerian, but in my opinion such remedies have little or no value except for sudden emergencies.

In cases of anæmia iron and arsenic may be employed, but, especially with regard to the latter, no specific effect is to be looked for. Arsenic in this affection acts precisely as iron does—that is, it increases the number of red blood corpuscles and thus improves nutrition. In lymphatic subjects cod-liver oil and iodide of iron may be employed, care being taken not to impair the digestion. In gouty subjects alkalies may be employed: Brocq prefers benzoate of lithium, carbonate of lithium, benzoate of sodium, or bicarbonate of sodium, associated or not with extract of gentian, rhubarb, or aloes.

In oily hyperidrosis (seborrhœa oleosa) ergotin is recommended by some writers. Brocq suggests the following formula:

℞ Ext. belladonnæ, ... gr. $\frac{1}{60}$–$\frac{1}{10}$.
Lithii benzoat.,
Ergotin., ... āā gr. iss.
M. Fiat pil. No. 1. One to five of these pills to be taken daily.

The sulphuret of calcium has given good results in some hands in doses of gr. $\frac{1}{10}$ twice daily.

The local treatment of seborrhœa is the most important. It varies as the disease occurs upon the scalp or on the smooth parts.

In seborrhœa of the scalp the first thing necessary is to remove all scales and crusts. When the scalp is irritable an egg shampoo may be employed, but in the majority of cases some soapy application is preferable.

One of the best soap preparations is the spiritus saponis kalinus of Hebra, made by dissolving two parts of genuine Stuttgart sapo viridis or green soap in one part of alcohol. The solution is filtered and flavored with oil of lavender. This preparation is somewhat imperfectly represented in the United States Pharmacopœia by the "Tinctura Saponis Viridis," which may be employed, however, when it can more conveniently be obtained. A teaspoonful more or less is mixed with warm water and used as a shampoo. After thoroughly cleansing the scalp, it may be washed out with pure water and thoroughly dried, after which the medication properly so-called may be applied.

Sulphur preparations are very useful in seborrhœa of the scalp. One form in which sulphur may be applied is in that of a lotion.

℞ Sulphur. præcipitat.,	ʒ iv.
Tinct. camphoræ,	fl. ʒ vi.
Glycerini,	fl. ʒ i.
Aquæ destillatæ,	q.s. ad fl. ℥ iv.

M.

This is to be well shaken and applied along parallel parts made at an inch distance by the aid of a comb. It leaves a deposit of sulphur directly upon the scalp which is very efficacious, and may be allowed to remain in contact with the diseased parts for several days before it is washed off.

I may mention here that when a patient suffering with seborrhœic alopecia is shampooed for the first time, a large fall of hair is observed which is sometimes a cause of disquietude. The patient may be reassured, however, by the information that the hairs thus falling out have already been detached from their follicles and are "hanging by the eyelids," so to speak, being attached simply by the crusts and scales. After two or three applications of the soap wash, the fall diminishes greatly. The shampooing should not be repeated oftener than once or twice a week for fear of irritating the scalp.

To return to the more strictly medicinal applications, I fear it will be found that the sulphur lotion above recommended will be unpleasant to many persons because there is necessarily a continual coating of sulphur upon the scalp which is somewhat unsightly. So that,

although it is probably the best form of sulphur application, yet we are sometimes driven to employ more agreeable methods.

Among these, ointments are perhaps the only preparations which need be mentioned. Ointments are objected to by many patients, but they form an excellent method of bringing medicaments into close relation to the affected parts. I prefer them made with petrolatum as a base because some of the inconvenience of clogging the hair is thereby avoided. The following is an excellent formula:

℞ Sulphur. præcipitat., ... ʒi.
Petrolati, ... ℥i.
M.

Ichthyol may be added to advantage in some cases, although its disagreeable odor is objected to by some patients:

℞ Sulphur. præcipitat., ... ʒi.
Ichthyollis, ... ʒss.
Petrolati, ... ℥i.
M.

I find salicylic acid a convenient addition to the sulphur ointment:

℞ Acidi salicylici, ... ʒss.
Sulphur. præcipitat., ... ʒi.
Petrolati, ... ℥i.
M.

Vidal prefers a somewhat different basis for sulphur ointments to be used in seborrhœa capitis. The following is his formula:

℞ Sulphur. præcipitat., ... ℈ij.
Olei theobromi, ... ℈iv.
Olei ricini, ... ℥i.
Bals. peruviani,
seu Tinct. benzoini, ... q. s.
M.

Sometimes a fluidrachm of tincture of cantharides is added to stimulate the growth of the hair.

Besnier and Doyon recommend a pomade as follows:

℞ Acid. salicylic.,
Resorcin,
Balsam. peruvian., ... ää gr. viij.–xv.
Sulphuris præcipitat., ... ʒi.–ij.
Lanolini,
Petrolati, ... ää ℥i.
M.

A small quantity of this preparation is well rubbed into the scalp in the evening and washed out again the following morning.

If it is desired not to wash the scalp so frequently, a minimal portion of the ointment may be used every evening until the scalp becomes somewhat caked, and then it may be washed out with soap.

Mercurials are sometimes used instead of sulphur preparations. They have the advantage of being less disagreeable to persons who dislike the smell of sulphur.

Of course the scalp should be thoroughly cleansed before applying mercurials, more especially if sulphur or other preparations have been used previously. With sulphur in particular, mercurials form a chemical combination having a disagreeable stain. If a mercurial lotion is desired the following may be employed:

℞ Hydrarg. bichlor., ... gr. iij.–x.
Alcoholis (90°), ... fl. ʒ iij.–vi.
Aquæ rosæ, ... q.s. ad O i.
M.

Another formula which may be used is this:

℞ Hydrarg. bichlor., ... gr. iij.–x.
Ammonii chloridi, ... gr. v.–x.
Aquæ lauro-cerasi, ... fl. ʒ iv.
Aquæ destillatæ, ... q.s. ad O i.
M.

One of these lotions may be employed in the daytime and then at night the following ointment:

℞ Hydrarg. oxid. flav., ... gr. x.–xx.
Petrolati, ... ʒ i.
M.

Or the following:

℞ Hydrarg. chlor. mitis, ... gr. xv.
Acid. tannic., ... ʒ ss.
Petrolati, ... ʒ i.
M.

In some cases saponated tincture of coal-tar or liquor carbonis detergens considerably diluted may be employed.

Pincus recommends citric or lactic acid in combination with boric acid, as in the following lotion:

℞ Acid. lactic. seu citric., ... gr. iv.–viij.
Acid. boric., ... gr. xv.–xxx.
Aquæ destillatæ, ... fl. ʒ iss.
Alcoholis, ... fl. ʒ ss.
M. Two or three teaspoonfuls of this lotion are to be well rubbed into the scalp at night.

Or in the following ointment:

℞ Acid. lactic., ... gr. xv.–ʒij.
Acid. boric., ... ʒ ij.–iij.
Axungiæ, ... ʒ i.
Olei olivæ, ... ʒi.
M.

After using one of these preparations for two or three weeks Pincus substitutes the following:

℞ Sodii carbonat., ... gr. xx.–ʒ i.
Petrolati, ... ʒ i.
Olei olivæ, ... ʒi.
M. To be well rubbed into the scalp for several minutes once or twice a day.

β-Naphthol is employed in some cases with success. The scalp is soaked with naphtholized oil, one per cent., and then washed out with naphthol soap, after which the following lotion is employed for some days:

℞ Naphthol, ... gr. viij.–xvi.
Alcoholis, ... O ss.
M.

when the shampooing is repeated.

An ointment containing naphthol and sulphur, one-half a drachm each to the ounce of petrolatum, may be substituted for these. It is to be rubbed in every night and the scalp may be cleansed by shampooing with naphthol soap at some days' interval as required.

Resorcin is sometimes employed successfully in connection with the treatment of seborrhœa capitis. Ihle recommends the following to be rubbed into the scalp with a soft brush:

℞ Resorcin, ... gr. vij.–xv.
Olei olivæ,
Olei amygdalæ, ... ää fl. ʒ ss.
M.

Or the following:

℞ Resorcin, ... ʒ ss.–i.
Olei ricini, ... fl. ʒ ss.
Alcoholis (60°), ... fl. ʒ iss.
Balsam. peruvian., ... gr. iij.
M.

Resorcin may also be combined with sulphur:

℞ Sulphuris præcipitat., ... ʒ i.
Resorcin, ... ʒ ss.
Petrolati, ... ʒ i.
M.

The treatment which I find most efficacious in the majority of cases consists in thoroughly shampooing the scalp with the spiritus saponis kalinus mentioned above, and then after washing out all soap suds and drying thoroughly, the application of the following:

℞ Acidi carbolici, ... gr. x.–xv.
Olei ricini, ... fl. ʒ ss.
Aquæ colognensis, ... ad fl. ℥ i.
M.

The hair is divided into parts by means of a comb or brush at distances of one inch, and then the oily lotion is dropped on at intervals by means of a dropper such as is used for collyria, and well brushed into the scalp.

The lotion is employed every night, but the frequency of shampooing depends upon the rapidity with which the scales reaccumulate. Once or twice a week is usually sufficient. Sometimes the following lotion seems to act better:

℞ Acid. salicylic., ... ʒ ss.
Acid. carbolic., ... gr. x.
Glycerini, ... fl. ʒ i.
Alcoholis, ... ad fl. ℥ i.
M.

The local treatment of seborrhœa of the smooth parts is in some respects that of acne and rosacea, which in fact usually accompany the disease in these localities. Some of the formulæ given above in the treatment of seborrhœa of the scalp will also be found useful in this form of the disease, but it must be remembered that the skin generally will by no means tolerate such active treatment or such strong applications.

In the simple scaly form (pityriasis corporis) a medicated soap, such as one of those made by Eichoff, containing sulphur, resorcin, tar, naphthol, or salicylic acid, or a mixture of two or more of these drugs, will be found useful to cleanse the surface. This may be followed by a mild ointment of salicylic acid, sulphur, or resorcin. Brocq recommends an ointment of calomel and tannin or of sulphur and salicylic acid.

The crusted form of seborrhœa is rebellious to teatment. Here soaps are useful and to be employed frequently, once or even twice daily. The spiritus saponis kalinus pure or diluted with water is of particular value. Sometimes a previous inunction with olive or cod-liver oil may be required to soften the crusts before they can be removed by the soap wash. Sulphur and salicylic acid may sometimes be added to sapo viridis to make a strongly detersive soap, and

the friction should be continued long enough to cause slight inflammatory reaction. After the soap is washed off a sulphur, salicylic-acid, or boric-acid ointment may be applied. Some writers recommend the soapy applications to be made at night and to be followed next morning with alcohol, tincture of camphor, or an alcoholic and ethereal solution of borate of sodium. When seborrhœic warts are present they may be removed by scraping, cauterization, etc., as ordinary warts.

Oily seborrhœa of the smooth parts is best treated by one of the sulphur lotions above mentioned, or by a powder of sulphur, salicylic acid, etc. It is extremely rebellious to treatment.

That form of seborrhœa of the smooth parts which is perhaps more properly termed eczema seborrhœicum, and shows itself chiefly upon the thorax in circinate or gyrate forms, yields to thorough washing and rubbing with medicated soaps followed by inunction with a sulphur or mercurial ointment.

Seborrhœa of the Lips.—This local form of seborrhœa is fortunately rare. It is extremely rebellious to treatment, particularly when it occurs in young girls. It frequently assumes the crusted form and is complicated by fissures of the lips and sometimes by eczematous infiltration. The treatment must be pursued upon the lines already laid down. Weak salicylic-acid ointments or ointments of salicylic acid and sulphur during the night, followed by the constant application through the day of glycerole of starch, pure or with the addition of a little salicylic acid, sulphur, or borate of sodium. In desperate cases quadrilateral scarifications have sometimes ameliorated or cured the condition. I have never been driven to employ these, but I have employed in some severe cases applications of a five-grain solution of caustic potassa followed by a mild ointment, such as one of equal parts oxide of zinc ointment and petrolatum. In applying the potassa, the utmost care must be taken to dry the lips and especially to prevent the caustic reaching the moist buccal mucous membrane when it may denude large areas of the lining of the mouth by its rapid spread.

Asteatosis.

Asteatosis, diminished or suppressed sebaceous secretion, is connected with anidrosis and is in reality rather a symptom accompanying various diseases of the skin than a substantive affection.

The condition leads to a dry state of the skin with shedding of epidermis, pityriasis, and a tendency to cracking and fissuring of the folds, particularly when the skin is naturally thin and tender. It occurs in what may be termed a physiological state of the skin, as

in that which is connected with senility and in such pathological conditions as atrophia cutis and xeroderma or ichthyosis. To a less degree asteatosis may accompany such affections as psoriasis, lichen ruber, and prurigo and is to be treated in connection with the general disease condition.

Locally, asteatosis is to be treated by massage and inunctions of fatty substances as vaseline, cold cream, lanolin, etc.

What may be called artificial asteatosis occurs in persons exposed to the action of alcohol, ether, strong alkalies, etc., the treatment of which is naturally protection of the integument when possible, together with inunctions of fatty materials.

Comedo.

Comedo is a disorder of the sebaceous glands characterized by yellowish or whitish, pinhead sized elevations, containing in their centre blackish points. Very often the black points appear alone upon the unchanged skin. The disease is observed chiefly about the face, neck, chest, and back. Each single elevation is called a comedo (plural, comedones). The common name "flesh worms" or "grubs" is calculated to convey the erroneous idea that the small inspissated plug of altered sebum which can be expressed from the follicle is a parasitic worm or grub.

It is true that a little mite, the almost microscopic *Demodex folliculorum* is occasionally found in the mass. This parasite, the character and habits of which are little known, belongs to the acari. It cannot be regarded as in any way essentially connected with the disease. Its presence is merely fortuitous and without significance. The plug forming the comedo consists of altered sebaceous matter mingled with epithelial cells. The affection, although comparatively trifling and without subjective symptoms, is often extremely annoying to patients. It is due in part to idiosyncrasy, in part to a general sluggish performance not only of the functions of the skin but also of those of the whole body. Patients are apt to suffer from dyspepsia with constipation. In young women chlorosis and menstrual difficulties are apt to be present. The disease is preëminently one of the period of puberty; patients seeking relief from this complaint are almost invariably young men and young women, although the disease may occur in infants and young children.

Ohmann-Dumesnil has described a curious form of comedo, "double comedo," where two comedones are connected together, forming a sort of tunnel in the skin.

Crocker and other English dermatologists have reported a form

of comedo occurring in children which appears to be contagious. It occurs ordinarily on either side of the forehead in groups, rather than disseminated irregularly as are the lesions of ordinary comedo.

Treatment.

Local treatment suffices in some cases to relieve the condition. Frequent bathing of the affected surface will aid the process of removal. Stimulating ointments and those containing sulphur are useful, as the following:

℞ Sulphur. præcipitat., ... ʒ i.
Ung. aquæ rosæ, ... ʒ i.
M. Sig. To be rubbed in at night.

Sulphur lotions, such as those given under the head of Acne, may also be useful. Should the skin tend to become harsh under the use of these remedies, weak alkaline ointments may be used for a time, as this:

℞ Sodii biborat., ... ʒ ss.
Glycerini, ... ♏ xvi.
Ung. aquæ rosæ, ... ʒ i.
M.

An excellent application is the following:

℞ Aceti, ... ʒ ij.
Glycerini, ... ʒ iij.
Kaolini, ... ʒ iv.
M.

This forms a soft paste, which is to be spread over the surface at night and if possible in the morning also. If applied on the face the eyes should be kept shut, on account of the pungency of the vinegar. It loosens and dislodges the sebaceous plugs more satisfactorily than any other preparation with which I am acquainted. A watch key may be employed to press out the comedones, the end being gently but firmly pressed down over the sebaceous plug. Should this not yield readily, the point of a fine needle may be run into the follicle alongside of the comedo, and then moved around so as to loosen and detach the plug from its surrounding wall. Care should be taken not to use much force, for fear of inflaming the skin; for the Staphylococcus pyogenes is usually present, and if pressed down into the succulent tissues in the neighborhood finds its favorite pabulum and so gives rise to a pustule. If the comedo plug does not come out easily, it should be left for another time. It must be remembered that so long as the condition which produces comedo is present and effective, the comedones are apt to be reproduced. Several in succession may

have to be removed from the same glandular opening. Occasionally the tonic internal treatment required in acne is also required in comedo (see Acne).

Sometimes the contents of the sebaceous follicles become even more condensed and hardened than above described. The firm, almost horn-like plugs are gradually forced out of the mouths of the follicles, until they may stand up stiffly above the surface of the skin. Such a case came under my notice some years ago, the skin of the body, particularly over the shoulders, being the seat of the disease. The hardened sebaceous plugs in great numbers projected to the height of an eighth to a quarter of an inch, giving the surface of the skin a nutmeg-grater appearance viewed from a little distance. Hot baths, frictions with sapo viridis, and inunction with strong sulphur ointment may be used in such cases. Occasionally a horny outgrowth occurs in comedo. Sometimes this is a keratosis. At other times, as in a case I once had under observation, a bunch of fifteen to twenty hairs is found growing out of each diseased sebaceous gland.

Milium.

Milium is an affection of the sebaceous glands consisting in the formation of small, roundish, whitish, sebaceous, non-inflammatory elevations situated in the skin just beneath the epidermis. In Hebra's opinion the lesion consists of a sebaceous gland, or only a lobule of such gland filled with its secretion and no longer connected with the hair sac into which it previously opened, but forming an independent body embedded in the substance of the skin.

Milia are situated chiefly upon the face, especially upon the forehead, orbit, and cheeks, on the red part of the lips, and on the male and female genital organs. Around the corona glandis the little round bodies may sometimes be seen crowded together in large numbers; and they are also found upon the dorsum of the penis, the prepuce, and the scrotum, where they frequently lie close to the spots at which hairs emerge from the skin. The parts of the female external organs most frequently affected in this way are the nymphæ, the internal surfaces of which, for instance, often contain hundreds of them, and present in consequence a coarsely granular aspect.

Milia are often found where operations have been performed. Thus they may often be observed on either side of a linear cicatrix, this, as Hebra remarks, being probably due to the fact that several lobules of sebaceous glands cut across when the incision was made have remained isolated, and have subsequently become distended with sebum.

These globular bodies may also frequently be noticed to be present in large numbers on regions affected with some other cutaneous disease, such as lupus. In this case, too, it is probable that they arise in a similar way, for in the course of the formative and destructive changes which constitute lupus, certain sebaceous glands are very likely to have become separated from the hair sac, or some of the lobules of such glands from the rest of them.

But whatever may be the nature of the change which leads to the production of milium, it is at any rate certain that these little round, white bodies lie merely beneath the cuticle, and are not attached to any of the deeper structures, being fixed only by the lamina of epidermis which covers them. This is easily shown by the fact that they escape at once as soon as an incision is made into the epidermis which confines them. Indeed, they are sometimes cast off spontaneously when their cuticular covering is removed in the course of the physiological changes which it undergoes, and thus whole groups of these little bodies may be got rid of at the same time.

In old persons, as Crocker points out, a special form may sometimes be seen upon the face, especially on the forehead where slight degrees are not uncommon, and upon the nose.

Occasionally milia, especially upon the scrotum, penis, and eyelids, coalesce into comparatively large flattish tumors, from the size of a pea to that of half a bean, assume a yellowish color, and may become very hard from the deposition of calcareous salts, chiefly phosphate, with a little carbonate of lime, and constitute then the so-called cutaneous calculi.

Milia, Crocker says, are common in young infants, a fact to which my attention, I must admit, has never particularly been drawn. They here form the *strophulus albidus* of Willan, and according to this author probably occur from overstimulation of the skin by the child being held too closely to the mother. Robinson thinks that milia are of two kinds, of which one consists of miscarried embryonic epithelium from a hair follicle or from the rete, and contains no fatty epithelium and has no duct; the other has a duct and is really a deep-seated comedo, the contents consisting of fatty epithelium and cholesterin.

The milium masses on the eyelids of elderly people may be mistaken for xanthoma, but usually there is no difficulty in making a diagnosis.

TREATMENT.

The treatment consists in opening the little tumor with a fine-pointed knife, expressing the contents, and touching the interior of the sac with a drop of tincture of iodine or nitric acid, or touching it with a sharply pointed crayon of nitrate of silver.

Sebaceous Cyst.

Sebaceous cyst appears as a variously sized firm or soft, roundish, more or less prominent tumor having its seat in the skin or subcutaneous connective tissue (Duhring).

Sebaceous cysts vary from the size of a pinhead to that of a small orange. They are roundish in shape and either hemispherical or flattened. They may be single or multiple, of doughy consistence usually, but if inflamed may become quite pultaceous, or if old rather hard (Crocker). They are freely movable under the skin, not painful or tender, and grow very slowly as a rule. The scalp, face, back, and scrotum are the favorite localities for the development of these formations. Not unfrequently they exist for years without giving rise to inconvenience excepting when situated upon the scalp or upon some part of the body where the clothing rubs over or catches upon them. At times when excessively distended they break down and ulcerate.

Two kinds of tumors may be distinguished: one in which the duct is open, the other in which it is closed. Where the duct remains open, the tumor is usually flat in form, tending to extend itself laterally rather than above the level of the skin; this variety is most frequently encountered on the neck and back. Where, on the other hand, the duct has become obliterated, constituting the true encysted tumor, the latter assumes a semiglobular or even a globular form, projecting itself prominently beyond the level of the skin; it is common upon the scalp and occurring here is usually devoid of hair.

The skin over these tumors is normal or white from distention, unless they are inflamed, when it becomes red, and the cyst may break down and ulcerate and perhaps fungate, resembling a rodent ulcer. Occasionally horns are found growing from these cysts.

Sebaceous cysts are said to be caused by accumulations of epidermis and sebaceous masses in the follicles. Those which have come under my observation are certainly of this character. Paget, however, quoted by Crocker, regards them as new growths. The gland is obliterated quite early and the secretion must therefore come from the cyst wall. The contents, says Crocker (from whom most of this account is taken) may be meliceric—*i.e.*, fluid and honey-like—consisting of free granules and epidermic cells, or steatomatous, of more firm consistence, with more epidermic cells and less free fat. Cholesterin is generally present, and sometimes coiled-up hairs. The cyst wall is described by Cornil and Ranvier as made up of connective tissue with flat cells and parallel lamellæ of ground substance. It is

lined with epithelium, comparable to that of the tunica interna of the arteries, and in it fatty, calcareous, and atheromatous changes are common.

Török's observations go to show that nearly all sebaceous cysts are really dermoids, that there are papillæ with an epithelial covering in the cyst wall, and that it is the exception to find fat in the cysts, and that therefore it cannot be sebum. I am inclined to think that there are various affections of a different character which are commonly designated sebaceous cysts, and that in the future these are to be distinguished and classified rather by their microscopic than by their clinical appearance.

When the duct is patent the nature of the tumor is obvious, and the diagnosis of sebaceous cyst is readily made. Some of the contents can also in this case be squeezed out as further proof. When the duct is closed, it may resemble a fatty tumor; but the position and absence of lobulation will generally indicate its nature.

Treatment.

The treatment of sebaceous cyst is simple. The tumor should be excised, taking care to dissect out the whole sac or it will reform. The cyst itself is generally thin and easily ruptured, but it has a firm horny lining, which should be seized by the forceps after puncture while the cyst is being separated. In that form of sebaceous cyst which occurs upon the eyelid and which is known as *chalazion*, the incision over the tumor should be made on the conjunctival side, so as to avoid a visible scar.

STRUCTURAL DISORDERS.

The structural disorders of the sebaceous glands are either inflammatory in character or are of the nature of new growths. The former only will be considered in the present article.

All the inflammatory affections of the sebaceous glands are closely connected. They are all varieties of folliculitis sebacea. It will be convenient, however, from a clinical point of view to consider them under various headings as follows:

1. *Acne simplex;* 2. *Acne rosacea;* 3. *Acne atrophica;* 4. *Acne hypertrophica;* 5. *Acne keloid.*

Acne Simplex.

Acne simplex, sometimes called acne vulgaris, is an inflammatory disease of the sebaceous glands characterized by the formation of papules or pustules, or a combination of these lesions, together with

a certain degree of erythema, and occurring chiefly upon the face and over the shoulders, although it may occur upon any part of the surface where sebaceous glands exist.

It may occur alone or in connection with other affections of the sebaceous glands, as comedo and seborrhœa. The lesions are of various sizes, from a pin's head to a large split pea, and are commonly seen in both the papular and pustular, or the tubercular and pustular forms combined. There is usually no discomfort from the lesions excepting a feeling of soreness when touched. Their color is bright red to dusky violaceous.

The number of lesions varies in different cases from one or two to a very great number. The inflammation may be superficial or deep, even forming abscesses. The individual lesions may run their course in a few days, though the course of the disease as a whole is apt to be chronic, running on for years. If there has been much suppuration, more or less unsightly scars may remain.

Acne is one of the commonest diseases of the skin. In this country the statistics of the American Dermatological Association show its occurrence in the practice of specialists to be in the proportion of 9,077 cases in 123,746, or 7.34 per cent. among all diseases of the skin. I am inclined to think this an under-statement of the relative frequency of the disease. Many cases go untreated because patients have been assured by the family physician that the disease is incurable, or that it will get well of itself in time, or that it will not do to drive it in, etc.—refuges of ignorance which may satisfy the conscience of the physician, but which entail at times a great amount of shame and humiliation on young persons, particularly women, solicitous of their appearance. Acne occurs in the young of both sexes, appearing about the age of puberty. It does not often occur in children, and, on the other hand, only rarely makes its appearance for the first time in mature years.

The pustules of acne are from the size of a pinhead to that of a pea, rounded or acuminate, seated on a more or less infiltrated base of superficial or deep inflammatory product. Suppuration may be slight or abundant. When the base is deeply infiltrated the affection is known as acne indurata. In this last form the process sometimes runs on to the production of abscesses, which appear chiefly on the face and down the shoulders and back, forming a most serious and annoying phase of the disease. Indurated acne is apt to result in the formation of cicatrices, of a pitted or atrophic character, which are quite disfiguring. Sometimes keloid occurs as a result of indurated acne, the lumpy scars lasting some months, but finally in most cases disappearing spontaneously.

Etiology.

The causes predisposing to acne are numerous and varied in their nature. I know of scarcely any other disease of the skin in which the satisfactory result of treatment depends so much upon the recognition of the exciting cause. In its commoner forms it appears to be dependent to some extent upon the character of the skin. Persons with thick, oily skins are most apt to suffer from the diffuse form of acne, with numerous papular and pustular lesions mingled with comedones, while the sparse eruption of flat and papular lesions is often found in pale, anæmic individuals with dry, rather harsh skins. The most frequent predisposing cause of acne is puberty. The affection shows itself for the first time, in the vast majority of cases, at this period, and is apt to continue, unless remedial measures are adopted, until the system has assumed the equilibrium of adult life, or in woman until a later period. It is at the period of puberty that the sebaceous system takes on a new activity, the hairs begin to develop, and there is a sort of normal hyperæmia about the follicles, which may easily determine an abnormal condition resulting in the development of sebaceous disorders. Other causes which may, either alone or combined, predispose to the occurrence of acne are scrofula and cachexia (acne cachecticorum) or general debility. Anæmia and chlorosis also may be mentioned in close connection with these other causes as favoring the development of acne, and in the more markedly pustular and indurated varieties a family history of tuberculosis is very often noted. Of great importance in the causation of acne, and especially in favoring its continuance, is habitual derangement of the alimentary canal. Dyspepsia and constipation will be found present in the majority of cases, and often in such intimate relation to the disease that a fresh crop of lesions will follow every attack of indigestion or of costiveness.

Diseases of the nasal cavities may at times occur in connection with acne, but a causative influence has not been satisfactorily established.

Uterine disorders, especially of a functional character, are often the indirect cause of acne; but at other times the remote cause of the affection seems beyond finding out, the patient remaining in an apparently perfect condition of health. The immediate cause of acne is the invasion of the sebaceous follicle by the Staphylococcus pyogenes. The skin is probably at all times subject to the invasion of this parasite, and under favoring conditions, such as those above noted, it readily germinates and develops its noxious inflammatory influence. In a skin predisposed to the invasion of the staphylococcus, comedones

very frequently act as an irritant, provoking its invasion. The effort to remove a comedo by pressure with a watch key or otherwise is often observed to excite inflammatory action, and this will suggest the manner in which the comedo may become developed into the acne pustule.

The importance of this view of the etiology of acne, which is one of quite recent development, will be understood when the subject of local treatment is reached.

Diagnosis.

The diagnosis of well-developed acne presents few difficulties. We often meet with cases, however, where only a few imperfectly developed lesions are present, and where the affection may easily be mistaken for others of a widely different character. The age of the patient, the seat of the lesions, their chronic character, and their inflammatory nature must be taken into account. The acneiform eruption caused by tar may be recognized usually by the smell of that substance and by its presence in the follicles giving the appearance of numerous black points which differ in appearance from comedones. In the eruption caused by bromine and iodine (see Dermatitis) the lesions are apt to be larger, of a brighter and more acutely inflammatory nature, and, when well developed, the lesions tend to coalesce and to form elevated inflammatory areas covered with characteristic sebaceous crusts. Acne often closely resembles the papular and pustular syphilodermata, and great care must be taken to avoid mistakes in diagnosis. The history, the absence of syphilitic lesions on other parts of the body than those commonly affected by the eruption of acne, the uniform distribution of the lesions—those of syphilis tending to group—all serve to denote the presence of acne. When syphilis occurs on the forehead, or in one or two lesions on the nose alone, without any history whatever, as I have sometimes seen it, it is extremely apt to be taken for acne, and great caution must be taken in coming to a decision as to the nature of the affection in a case seen for the first time. Severe cases of acne are sometimes taken for variola, but this can hardly occur if a careful examination is made into the general symptoms and history of the eruption. Coccogenic sycosis also must be distinguished from acne.

Treatment.

The treatment of acne is of two sorts, constitutional and local. In order to treat a case of acne with any hope of success, we must first ascertain the causes which have operated in bringing it about. The

foundation of the successful treatment of acne lies in the knowledge of its etiology. The patient should be carefully examined regarding every organ and every function. The habits of life, the surroundings, and the occupation of the patient should all be known to the physician, who should also study the case well, to discover, if possible, what is the exact cause or group of causes of which the acne eruption is the expression and result. Without this little can be hoped for, and acne is one of the minor opprobria of medicine, chiefly because the physician cannot or will not take the trouble to enter into the patient's case with the persevering thoroughness which is indispensable. It should be the aim of the physician to prevent the appearance of the lesions. External treatment, although now regarded, in the light of recent advances in the etiology of the disease, as of much more importance than formerly, will rarely accomplish this, and internal measures must therefore be employed in almost every case. From what has been said under the head of etiology, it will be perceived that in general the patient's health must be looked after and the system rendered more resistant to the invasion and spread of the disease. If anæmic, tonics are required, among which arsenic and iron are prominent; if the uterine functions are not properly performed, these must be regulated; if dyspepsia exists, this must be combated by diet, regimen, and the remedies appropriate to the condition. Constipation is a frequent concomitant with acne, and its removal is necessary to a cure. Acidity of the stomach, flatulence, a coated tongue, are ordinary symptoms, and these, together with irregular and perverted appetite, are constantly met with in connection with the affection under consideration. If constipation exists, saline or vegetable laxatives should be prescribed in sufficient quantity to open the bowels once or twice a day. An occasional mercurial, as blue pill or a compound cathartic pill, may be prescribed in some cases. The following pill has proved useful in my hands:

℞ Pil. hydrarg.,
Ext. colocynth. comp., ... ää gr. iiss.
Pulv. ipecac., ... gr. ss.
M. fiat pil. No. i.

Two or more of these pills are to be taken at bedtime, followed by a saline, as a wineglass of Hunyadi water in a goblet of plain hot water before breakfast the next morning. They are not of course to be taken habitually—perhaps once in five or ten days will be often enough.

The admirable mixture devised by the late Mr. Startin, of London, known as "Mistura ferri acida," is one of the most valuable

aperient tonics which can be given for acne accompanied by constipation.

The following formula fairly represents it:

℞ Magnesii sulphat., ... ʒ i.
Ferri sulphat., ... ɔi.
Acidi sulphurici dil., ... fl. ʒ i.
Infus. quassiæ, ... ad fl. ʒ iv.
M. Sig. A tablespoonful in a tumbler of water before breakfast.

Crocker suggests the following:

℞ Ext. cascaræ sagradæ liq. (B. P.), ... ♏ x.–xx.
Tinct. nucis vomicæ, ... ♏ vij.–x.
Aq. menth. pip., ... ad fl. ʒ i.
M. Sig. Three times a day.

The natural mineral waters are used with success in acne. The Hathorn and Geyser Springs of Saratoga, the German Friedrichshall, Hunyadi Janos and Ofener Rakoczy, all cathartic, are of use, the dose of course varying with the amount of constipation present.

There are many cases of acne, however, which depend upon some general derangement of the system, the scrofulous taint, anæmia, etc., and these must be treated quite differently. Cod-liver oil will in many cases be found a very efficient agent, particularly when the lesions are indurated and tend to extensive multiplication over the trunk as well as the face, with the formation of numerous abscesses. The compound syrup of the hypophosphites is likewise of benefit in these cases, as is also the extract of malt, which may be employed in some instances to replace cod-liver oil when this is found to disagree. The bitter and ferruginous tonics are occasionally called for in this class of cases, and the mineral acids are often of value.

The following formula will be found useful in indurated acne, with a tendency to the formation of abscesses, occurring in cachectic and scrofulous individuals:

℞ Quininæ sulphat., ... gr. viij.
Acid. sulphuric. dil., ... ♏ x.
Ferri sulphat., ... gr. xxxij.
Magnesii sulphat., ... ʒ iij.
Tinct. zingiberis, ... fl. ʒ ij.
Aquæ, ... ad fl. ʒ viij.
M. Sig. A tablespoonful in a tablespoonful of water with a teaspoonful of cod-liver oil floating on it, morning and evening (T. Calcott Fox).

The following combination of iron with a mineral acid has sometimes proved of value when dyspeptic symptoms with anæmia coexist with the eruption of acne:

℞ Tinct. ferri chlor.,
Acid. phosphoric. dil., ... ää fl. ʒ i.
Syrupi limonis, ... fl. ʒ ij.
M. Sig. A teaspoonful in a wineglass of water thrice daily after meals.

Among tonics arsenic stands first, sometimes appearing to act almost as a specific in anæmic cases. It may be given conveniently in the form of Fowler's solution, in ♏i.–iv. doses, gradually increased until the limit of tolerance is reached, and then dropped a little below this and continued for a considerable period. The following formula is a favorite with me; it combines the arsenic with iron:

℞ Liq. potassii arsenitis, ... fl. ʒ ij.
Vini ferri, ... fl. ʒ iv.
M. Sig. A teaspoonful in water after meals.

Fowler's solution should never be prescribed alone, to be given in drops. This is an inconvenient and not altogether safe method of administration. Patients cannot be trusted to drop out the medicine with the requisite care; the size of the drop may differ with different bottles, and it is always dangerous to allow a bottle of concentrated and poisonous medicine to go into the hands of unskilled and perhaps careless people. If it is desired to omit the iron, the Fowler's solution may be given in cinnamon water or in plain water, as I often prescribe it. It should not be mixed with syrups, as is sometimes recommended, for patients are apt to revolt against the cloying sweetness, and it not infrequently disagrees. I may say here that iron does not agree with some acne patients. As Fothergill says, iron does not agree with "bilious" people. Instead of arsenic, mercury may be given. R. W. Taylor prefers the following formula:

℞ Hydrarg. bichloridi, ... gr. i.
Ammoniæ muriat., ... gr. vi.
Tinct. cinchonæ comp., ... fl. ʒ iij.
Aquæ, ... fl. ʒ i.
M. Sig. A teaspoonful in a wineglassful of water three times a day, an hour after meals.

The dose here is gr. $\frac{1}{12}$ which may be increased every ten days until in general the limit of toleration is reached. The effect of this treatment begins in about two or three weeks. Of course it is not to be understood that syphilis is suspected in the cases in which mercury is recommended. It is simply employed as a tonic alterative. In cases in which it may be desired to combine mercury and arsenic, Taylor recommends "De Valangin's solution," liquor arsenici chloridi, which may be given in connection with the bichloride of mer-

cury. The dose of this solution is the same as that of Fowler's solution. The sulphur mineral waters, as those of Richfield, Sharon, Avon, the White Sulphur of Virginia, etc., have a reputation for beneficial influence in acne. I am inclined to believe that there is something specific in the effects of the waters themselves, though much of the good effected is gained by the pure and general tonic effect of the surroundings. Hygiene, in the form of fresh air, exercise, cold bathing, and a sojourn in the country or by the seashore, will now and then effect what medicines may fail to do. It should be added that seashore life is found occasionally to disagree with acne patients, bringing out the eruption in great abundance. Inquiry as to any possible idiosyncrasy of this kind should be made before sending patients to the seashore, and they should be directed to change at once if the climate should prove unsuitable.

The *local treatment* of acne is of great importance, especially in the present state of our knowledge regarding the important part played by the organisms which induce inflammation and suppuration. The choice of remedies is particularly important.

There is perhaps no skin disease in which so many local applications have, at one time or another, been recommended. Used with discretion a few will suffice, but the great number of formulæ extant serves only to confuse the practitioner in search of an appropriate topical application. For this reason I shall give only a selection of those ordinarily used, and this shall embrace the preparations which I am accustomed to employ daily in my own practice, and which I can therefore vouch for from extensive personal knowledge of their good effect.

The external treatment of acne may be either soothing or stimulating. In a small number of cases there is much heat, redness, and acute inflammation present, and here mild washes and bland ointments, such as those to be given under the treatment of eczema of the face, will best answer.

When the case is a mild one, and there is not too much irritation, a medicated soap such as those devised by Eichoff, containing sulphur, salicylic acid, ichthyol, or a small percentage of bichloride of mercury, may be employed to cleanse the surface and remove some of the oily and epithelial débris, after which a saturated solution of boric acid in alcohol of 96° may be sopped on or applied on compresses to the lesions. The parasiticidal effect of this remedy upon the purulent lesions is quite marked. Sometimes the more recent lesions may be aborted by means of this or similar applications. Bathing the affected parts with hot water is usually of advantage and may be practised twice daily, once when washing with medicated

soap and once without. Immediately after the hot-water application the borated alcohol may be employed, or if a somewhat more active application is needed or can be borne, the following lotion may be employed:

℞ Hydrarg. bichlor., ... gr. vi.–xij.
Alcoholis, ... fl. ʒ iss.
Aquæ destillat., ... q.s. ad fl. ʒ iv.
M.

This may be diluted with water at first, and gradually made stronger. The patient should be warned against its possible irritating effects, and also with regard to its influence upon metal, as rings, etc. It should not of course, be employed with sulphur in any form.

Another formula often used is the following:

℞ Hydrarg. bichlor., ... gr. iv.–viij.
Tinct. benzoini, ... ♏ xxx.–fl. ʒ i.
Emuls. ol. amygdalæ amaræ, ... fl. ʒ iv.
M.

Hebra's "Oriental lotion," a popular remedy, is composed as follows:

℞ Hydrarg. bichlor., ... gr. viij.
Aquæ destillat., ... fl. ʒ iv.
Succi limonis, ... No. 2.
Albumin. ovi, ... No. 6.
Sacch. alb., ... ʒ i.
M.

A combination of bichloride of mercury with sal ammoniac is often employed, as in the celebrated "Gowland's lotion," which is composed of one part each of chloride of ammonium and bichloride of mercury in two hundred parts of emulsion of bitter almonds. The following is a convenient combination:

℞ Hydrarg. bichlor.,
Ammonii chloridi, ... āā gr. iv.
Aquæ destillat., ... fl. ʒ iv.
M.

Sometimes sulphur preparations are serviceable, especially in more severe cases. One of the sulphur lotions most commonly employed is the following:

℞ Sulphuris præcipitat., ... ʒ i.
Ætheris, ... fl. ʒ vi.
Alcoholis, ... q.s. ad fl. ʒ iv.
M. Sig. Shake well before using.

℞ Ammonii sulphichthyolatis, ... gr. xij.–℥ij.
Alcoholis (90°),
Ætheris, ... ää fl. ʒ iv.
M.

It is usually well to begin with the milder strength of ichthyol and gradually increase it. The application can usually be allowed to remain on over night. If found irritating, it can be removed after half an hour and the parts covered with a slight application of the following ointment:

℞ Acid. boric., ... ʒ ss.
Acid. salicylic., ... gr. x.
Ung. zinci oxidi, ... ℥ i.
M.

Naphthol has been recommended in rebellious acne. Brocq uses the following:

℞ Pulv. naphthol,
Pulv. camphoræ,
Pulv. resorcin, ... ää ʒij.
Sulphur præcipitat., ... ʒ ij.–iij. ʒi.
Saponis viridis, ... ʒ i.
Cretæ præparatæ, ... ʒi.
Petrolati, ... ʒij.–iv.
M.

This application, which is perhaps too strong for most cases, should be allowed to remain in contact with the skin for only a quarter or half an hour, and should then be washed off and replaced by oxide-of-zinc ointment containing a small quantity of salicylic acid.

In mild cases Brocq employs a similar ointment containing gr. viij. each of naphthol, camphor, and resorcin, gr. xlv. of sulphur, gr. xij. of sapo viridis, and ʒ v. of vaseline. This may be allowed to remain in contact with the skin all night.

In extensive acne indurata with small abscesses, especially when the back is covered with numerous suppurating lesions, a system of disinfection of the surface should be employed. The patient should remain in a warm bath until the skin is thoroughly softened, and then some disinfecting soap, a bichloride soap of some kind or the compound soap of resorcin, salicylic acid, and sulphur (Eichoff), is thoroughly rubbed into the surface.

The larger suppurating lesions should be opened with an acne lancet, the contents very gently expressed, and a small quantity of pure ichthyol should then be introduced into the cavity on a small probe or sharpened stick.

Too much pressure should be avoided in emptying the contents of

acne pustules, as it is possible to press the virulent matter into the surrounding tissues and thus create new foci of suppuration.

Some of the soapsuds may be left in contact with the skin, or an ointment containing gr. i.–xx. of salicylic acid, a drachm of boric acid to the ounce of vaseline, may be gently applied. If there is any considerable amount of serous leaking, which may occur where many abscesses have been opened, a dusting powder composed of one part to four each of oxide of zinc and starch may be dusted over the surface.

Other and severer remedies for acne have been recommended by authors, but I have little experience with them, and believe that, in this country at least, the severer measures will usually prove too much for the skin, and will be more apt to prove injurious than beneficial.

Whatever plan of treatment is adopted, it is of the utmost importance that it be thoroughly carried out. The physician should, at first especially, see the patient every day or every few days, to ascertain if his directions are being properly followed. As Taylor remarks, much of the discredit which is attributed to physicians in the treatment of acne is due to one of two causes: first, either they are not sufficiently careful, precise, and emphatic in giving the directions for treatment; or secondly, the patients only carry out their directions in an imperfect and indifferent manner. The patient should always be given to understand that unless he does what the physician directs him to do to the letter, the latter is not in any way responsible for his case.

The prognosis of acne should always be guarded. While by no means the desperate and incurable malady which it is sometimes said to be by pessimistic or incapable practitioners, yet it often offers a stubborn resistance to treatment, and shows a marked tendency to relapse. The most extensively developed cases, moreover, are sometimes more amenable to treatment than those where half a dozen lesions alone represent the disease, and where the patient enjoys apparently good health. The question is, in the long run, one of time only, as a spontaneous cure sooner or later almost invariably occurs. If neglected, however, unsightly and disfiguring scars supervene in severe cases, and our efforts, therefore, should be unremitting to obtain a speedy cure if possible.

Now and then keloid follows as a result of pustular acne. This condition, though unsightly and disfiguring, disappears spontaneously with the lapse of time, perhaps in three to twelve months. Treatment usually fails to hasten its disappearance.

Acne Rosacea.

Acne rosacea is a chronic, hyperæmic, or inflammatory disease of the face, more particularly the nose, characterized by redness, dilatation, and enlargement of the blood-vessels, hypertrophy, and more or less acne. There are two classes of cases: 1. Those in which acne papules and pustules form the most prominent symptoms, while bright-red congestion with some infiltration of the skin forms the background; 2. Those in which a sort of erythema, or flushing, is the symptom, superadded to which occurs in chronic cases an enlarged and varicose condition of the superficial cutaneous veins with occasional hypertrophy of the nose.

The first variety is in reality more closely allied to simple acne. It occurs, however, usually in older persons, not often showing itself in women under twenty-five or thirty years of age, and in men not until an even more advanced period. While the nose is the chief seat of this form of acne rosacea, it is likewise frequently encountered upon the cheeks and sometimes upon the forehead and chin. While the entire course of the disease may be chronic, it usually proceeds by acute exacerbations or by attacks following some digestive, uterine, or other derangement. In the second variety hyperæmia, or flushing, is the earliest symptom, intermittent at first and noticeable only after exposure to a close atmosphere or following the use of alcoholic stimulants or a full meal. This hyperæmia is passive at first, the nose is cold to the touch and sometimes shows slight seborrhœa. Gradually the redness grows more marked and permanent. If now the nose is examined, small, tortuous blood-vessels can be seen ramifying in the skin of the affected part. The disease varies in intensity in different cases, from a slight blush to a marked deformity. The face and particularly the nose are the parts usually attacked. The course of this form of the disease is chronic, sometimes extending over years. The process usually goes no further than the formation of swollen and torturous blood-vessels, with diffuse redness, but sometimes hypertrophy of the connective tissue takes place, with grotesque enlargement and deformity of the nose, which becomes knobby, irregular in shape, and may grow to an enormous size (see Acne Hypertrophica).

Etiology.

The causes of acne rosacea are various. It occurs both in men and women, but in the latter does not often tend to go beyond the first stages; in women also the disease is more prone to occur at two

periods of life, at early womanhood and at the climacteric period. When occurring in young women, seborrhœa is apt to be present, and the disease appears to be due, in some measure certainly, to dyspepsia, anæmia, chlorosis, or menstrual difficulties. Sometimes the first variety occurs during pregnancy without any other sign of ill health and in persons who seem perfectly robust. It usually goes away under treatment, but may return in later life. When it occurs in later life it is apt to be more severe. In men the disease may occur at any period. In early life it is generally due to anæmia and debility, nervous prostration, or dyspepsia. In later life the use of spirituous liquors is often the cause, and, perhaps nearly as often, dyspepsia in some of its forms. Habitual indulgence in alcoholic or malt liquors gives rise to this condition in various regions of the face.

Diagnosis.

The diagnosis of the second variety of acne rosacea presents no difficulties. In the first variety, however, in which acneiform lesions, pustules, sebaceous crusts, etc., predominate, the diagnosis is not always plain.

The tubercular syphiloderm of the nose and face, lupus vulgaris, lupus erythematosus, and severe forms of eczema are most commonly confounded with acne rosacea.

Prognosis.

The prognosis of the first variety, at least in the early stages, is favorable, and there are few affections of the face in which more striking and rapid results can be obtained, up to a certain point, than in those cases of acne rosacea where there is a "red face" with numerous papular and pustular lesions, with little or no capillary dilatation. When, however, we have the second to deal with, and especially when the disease has become thoroughly established, only thorough and long-continued treatment will avail. Where the capillary enlargement is already marked, treatment beyond a certain point is, in most cases, little more than palliative; but it may prevent further progress, and this is much, and patients should be encouraged to persevere, especially in the treatment by scarification.

Treatment.

The treatment of acne rosacea depends upon the stage of the disease and upon its cause in the given case. Constitutional and local remedies are both used. The causes giving rise to the affection should be diligently sought for and removed when possible. Uterine and menstrual derangements are to be looked after, the stomach and

bowels kept in good order, and all hygienic measures used to improve the general health. Alcoholic and malt liquors are to be totally eschewed. Tea and coffee should be drunk in moderation and not strong. Inveterate tea drinkers are very apt to have red noses. Tea is often made to take the place of food, and gradually brings on a sort of dyspepsia peculiar to itself. The food should be of the plainest character. The general medical treatment is that of acne. Local treatment, however, is of the most value. Sulphur ointments, as in acne, may be used in the early stages, the following formula being a useful one:

℞ Sulphuris præcipitat., ...	ʒ i.–ij.
Ung. aquæ rosæ, ...	ʒ i.
M.	

Sometimes lotions are more useful.

The following lotion, known as "Lotio sulphuris cum tragacantha," is one of the very best in the treatment of acne rosacea, as well as all forms of acne simplex in which the rosaceous element is prominent:

℞ Sulphuris præcipitat., ...	ʒ ij.
Pulv. camphoræ, ...	gr. x.
Pulv. tragacanthæ, ...	gr. xx.
Aquæ calcis,	
Aquæ rosæ, ...	ää fl. ʒ ij.
M.	

This may be applied once to several times a day. In one of the most rapid cures of rosacea I ever observed, the patient kept putting on successive layers of the wash every few hours until her face was covered with a thin yellow crust. Sometimes the wash seems to draw the skin and gives rise to an uncomfortable sensation. In this case the sulphur ointment mentioned just above may be applied in small quantity after each application of the wash. On the whole I have gotten more benefit for patients out of this wash than any other, and I count it the best application in acne rosacea. It will not always do good, however, and we are sometimes driven to try other plans of treatment. Ichthyol washes of various strengths are often useful in acne rosacea. A wash of corrosive sublimate of the strength of gr. ¼ to gr. ij. to the ounce of alcohol, or corrosive sublimate ointment somewhat stronger, sometimes answers well in the first stage of the disease. Neumann and Hebra recommended mercurial plaster spread on cloths. George H. Fox suggests the employment of chrysarobin as in acne. Of course this is to be watched, lest the irritative effect of chrysarobin be produced.

In the second variety of acne rosacea, where numerous well-defined

blood-vessels can be seen coursing under the skin, the treatment must be somewhat different. Scarification in some form here offers the best chance of improving the condition of the skin. The dilated capillaries may be incised with a sharp knife, in the hope that adhesive inflammation may result with the effect of closing the vessels. The plan which I follow by preference, however, is that of cross-hatching the entire surface involved, not at one sitting, but in a series of operations. The larger vessels, if such are present, may first be slit up, and then with a multiple-blade knife, held like a pen in the hand, a series of parallel cuts are to be made extending to about one-sixteenth of an inch below the surface. These are then crossed by a similar series of cuts at right angles, and in some cases a third series of cuts may be practised. As the object is not precisely the same as in the similar treatment of lupus, it is not necessary or desirable to hash up the skin by a number of successive incisions at various angles. To prevent cicatrices, it is indeed sometimes better to practise only a single series of parallel cuts at one sitting. It is usually desirable to benumb the surface before operating in this way, especially on timid or nervous persons, and this may be done by means of freezing. A small gauze bag filled with mingled ice and salt will produce the effect desired, but this may be accomplished more readily by the use of a hand-ball atomizer charged with rhigolene.

The little operation completed, the parts may be bathed with cold water or tightly compressed with absorbent cotton until bleeding has ceased. Cold-water compresses are to be applied subsequently, to control the bleeding. After this a bit of dry lint or some simple dressing may be applied for a few hours. So soon as the soreness has passed away, perhaps in a week's time, scarification may be practised again. A number of scarifications are usually required, the treatment running over a number of months, and requiring patience on the part of both operator and patient. Eventually, however, a greater degree of success is attained by this method than by any other with which I am acquainted. The skin heals over without a scar, or with such minute cicatrices as are hardly worth notice, and a marked amelioration in the appearance of the nose is the result. Of course, there is a strong tendency to relapse. The closure of some capillary channels naturally leads to the dilatation of those collateral, and thus new vessels appear as old ones are obliterated. Sooner or later, however, a marked impression is made, and a fair result may be hoped for even in severe cases. What the tendency may be towards relapse after several years I cannot say, as I have practised the method only for the past few years.

The sulphur and tragacanth wash may be employed concurrently

with the surgical treatment described, as it tends to keep down the preliminary erythema.

Another treatment is painting the affected parts once or twice a week with a ten- to twenty-grain solution of caustic potash and following this by an emollient poultice. In cases where there is but little thickening, carbolic acid, dissolved in three or four parts of alcohol, may be painted on every second day. Hardaway recommends electrolysis, using a number thirteen cambric needle inserted into any convenient handle, and connected with the negative pole of a galvanic battery. A sponge electrode is then connected with the positive pole. The needle is inserted sufficiently deep to enter the dilated vessel; so soon as this has been accomplished the patient completes the circuit by taking the sponge electrode in his hand. When the electrolytic action has been properly developed, the patient releases the sponge electrode, after which the operator withdraws the needle. Six to eight elements will generally suffice. If the vessel to be operated upon is a long one, several punctures must be made at suitable intervals of space. The needle may be inserted perpendicularly or in a line with the course of the vessel. In those rare and severe cases where knobby and gross deformity of the nose exists, decortication with the knife is the only remedy.

Acne Atrophica.

Acne atrophica is a form of acne running a very chronic course and accompanied by necrosis of the tissues, leaving a depressed cicatrix like that left by the pustule of small-pox. The affection appears in the form of papular or nodular lesions, from the size of a pinhead to that of a pea, slightly elevated, of a dark-red or violaceous tint, with a small yellowish, central, easily detached crust occupying a depression. This crust gradually increases in size and finally falls off, leaving a depressed cicatrix, one-eighth to one-fourth of an inch in diameter, red at first and gradually becoming white. The disease originates in a pilo-sebaceous perifolliculitis of the middle and upper portions, with a destructive and necrotic tendency. In a case examined by Fordyce numerous staphylococci were found at such an early stage of the disease as to indicate a microbic origin. Crocker thinks that the little horny plug which appears at the orifice of the follicle acts as a source of irritation.

Acne atrophica usually occurs upon the temples and anterior borders of the scalp, the alæ nasi, and between and upon the eyebrows. It may, however, occur in a diffused form over various other portions of the body. The affection is one of middle age and is peculiarly

inveterate. Brocq considers it allied to the ulerythema acneiformis of Unna. It is to be carefully distinguished from certain forms of syphilis which it closely resembles. Tincture of iron and iodide of potassium internally, with antiseptics, particularly mercurial ointments, externally, form, according to Crocker, the best treatment.

Acne Hypertrophica.

When acne rosacea of that form characterized by vascular dilatation takes on an extreme development, a new variety of the disease occasionally presents itself. The excretory orifices of the sebaceous glands become greatly dilated, the glands themselves become hypertrophied until they may become tenfold their normal size, while the tissues around take on an elephantiac appearance.

The affected parts are of a dusky red, violaceous appearance, irregular and mammillated in outline, with very numerous and greatly enlarged glandular orifices. The most grotesque deformity may result: the nose may become as large as the fist and may hang down over the upper lip or even to the chin. Such cases are of course extremely rare. The neighboring regions of the cheeks and of the forehead are often involved at the same time, but to a much less degree.

Two anatomical varieties of acne hypertrophica have been described by Vidal and Leloir: a *glandular* form, where the surface is bosselated and where hypertrophy of the pilo-sebaceous glands is chiefly present; and an elephantiac form, which is that usually called rhinophyma, where the surface is smooth and which is characterized by chronic œdema of the skin with vascular dilatations, and sclerosis of the derma.

The only satisfactory treatment for this affection is decortication.

Acne Keloid.

(Dermatitis papillaris capillitii; Keloidal sycosis of the nucha, etc.)

This affection, which partakes of the nature of both sycosis and keloid, is usually found upon the back of the neck just below the hairy scalp. It may, however, occur elsewhere, as about the jaws, etc. The initial lesion is a follicular and perifollicular inflammation simulating ordinary acne. It is accompanied, however, from the beginning by a deep infiltration of the derma which can be perceived by pinching the skin between the fingers.

The hair follicles involved are usually completely destroyed; some, however, persist and often appear in the form of a bunch of two, three, or more hairs springing from a common opening in the centre or edge

of a keloidal tubercle, and resembling a sort of brush. These hairs are thick and twisted, being evidently altered from their normal condition. Around each pustule of acne a keloidal growth forms, constituting in time a nodulated, hard tumor over the entire area implicated. The nodules vary in shape and elevation, but are mostly somewhat conical and about the size of a large indurated acne tubercle. In the white races the color of the lesions is a bright red or rose color, sometimes showing fine branching capillaries like those observed in keloid. About the border of the affected region small acneiform pustules or rather folliculitic pustules are seen which are traversed by hairs.

The lesions have a tendency to group and form by confluence large indurated masses, which resemble, and in fact are usually considered, keloidal tumors. The seat of the affection is almost invariably upon the back of the neck, just below the edge of the scalp, where it occupies a broad transverse band about where the collar rubs. It may occur, however, elsewhere. Acne pustules are usually found at the same time scattered about, especially in the region of the mustache and beard.

Lebou has shown that acne keloid is a perifolliculitis of the hair follicles in which the embryonal tissue surrounding the follicles, instead of tending to suppuration, goes on to the formation of sclerous tissue.

Acne keloid is extremely rebellious to treatment, and the prognosis, when the disease is fully developed, is unfavorable. All sources of irritation should be avoided, a large soft collar should be worn, or better, no collar. In the early stages of the disease the acneiform pustules should be destroyed as soon as formed. They should be opened and tincture of iodine or solutions of bichloride of mercury or ichthyol should be applied to the cavity. External treatment over the whole surface, including the surrounding skin, should be continuously employed. Salicylic-acid rubber plaster on the lesions, with frequent and thorough applications of a bichloride soap or sapo viridis, should be followed by applications of a parasiticidal character, as ichthyol, a saturated solution of boric acid in alcohol, etc. Occasionally poulticing with starch poultices sprinkled with boric acid will aid the treatment.

The thermo-cautery may also be used with good effect. The knife, which is very frequently called into play in the removal of the tumors, is not effective unless immediately followed by cauterization. There is no doubt that the affection is infectious and due to the invasion of some parasite not yet described. It spreads by auto-inoculation, which is favored by the use of the knife in operation.

DISEASES OF THE SWEAT GLANDS.

BY

ARTHUR VAN HARLINGEN,

PHILADELPHIA.

DISEASES OF THE SWEAT GLANDS.

THE affections of the sweat or more properly "coil" glands are either (A) functional or (B) structural in their nature.

FUNCTIONAL AFFECTIONS.

The functional diseases of the sweat glands may affect their secretion and excretion in diminishing or increasing the quantity of fluid poured out or in changing its chemical composition and appearance. The affections thus produced are known as *hyperidrosis*, *bromidrosis*, *chromidrosis*, *uridrosis*, *phosphoridrosis*, *hæmatidrosis*, and *anidrosis*.

Hyperidrosis.

Hyperidrosis properly so-called is an habitual general hypersecretion of the sweat glands.

It is often difficult to draw the line between physiological perspiration of an active sort and true morbid sweating. In general, however, it may be said that hyperidrosis is morbid when it continually exposes the patient to taking cold, and particularly when it produces a weakening of the nervous system.

The quantity of sweat secreted may exceed the normal in various pathological conditions, as fevers, etc., but as these are symptomatic in the stricter sense of the word they do not come under consideration in the present article. The hyperidrosis which may be termed essential may be divided into two classes, generalized and localized (*ephidrosis*).

Hyperidrosis is sometimes preceded by a disagreeable sensation of pricking, drawing, and oppression, due, according to Hebra, to a congestion of the capillaries of the papillæ, producing an excitation of the terminal nerve fibres. The sweat exudes from the glandular orifices, covers the surface, and even runs down in little drops and streamlets. Although it may be generalized over the whole surface, hyperidrosis is usually most marked in certain localities, as the forehead, the scalp, the axillæ, the groins and genital folds, the front of

the chest, the palms, and the soles. Hyperidrosis may occur as a complication of miliaria and sudamen.

Generalized hyperidrosis is more common in obese persons. Sudden emotion, or some nervous impression, or more frequently high temperature or exercise of a more or less violent character, may bring on the affection in those predisposed. Certain individuals are particularly subject to hyperidrosis, chiefly the nervous, hysterical, and rheumatic. French writers state that stubborn cases of ephidrosis, or partial sweating, are of more common occurrence in connection with the rheumatic diathesis. There is no question that the nervous system plays an important part in the causation of excessive sweating. It may act directly or through reflex influence.

In neuralgia sudoral hypersecretion is not uncommon. It belongs in such cases to the same order of phenomena as various other secretory disturbances, such as the lachrymal flux often observed at the close of an attack of facial neuralgia.

Notta (quoted by Bouveret [1]) has reported a case where neuralgia of the suborbital nerve was accompanied by an excessive secretion of sweat. An analogous case is cited from Desbrousse Latour where a patient suffering from double facial neuralgia showed during each attack an extremely abundant perspiration. The excessive sweating may exist in these cases over an area more extensive than that supplied by the affected nerve. A case is cited by Bouveret where neuralgia of the left side of the face was accompanied by anæsthesia of a portion of the skin supplied by the trigeminal. The pain ceased. Under the influence of pilocarpine general sweating ensued, most abundant on the left side of the face, and curiously enough, next to that, on the upper and lower limbs of the left side.

Paralyses of peripheral nerves are often accompanied by excessive sweating in the affected areas, and Weir Mitchell has reported cases where an alteration in the quality as well as in the quantity of sweat secretion has resulted. The sweat gives out an acid, acetous, or fetid odor. In these latter cases a certain amount of nerve excitation, shown by burning and redness of the skin, is noted, seeming to indicate that the sudoral nerve fibres are also excited, and that under the influence of such excitation, not only the quantity but also the quality of the sweat may be altered. These facts will seem even more interesting when we come to consider the subject of chromidrosis.

It must be noted, however, that in some cases of paralysis the sweat secretion is diminished and not increased, so that our knowledge on this point is by no means definite. I have thought proper, however, to indicate, as I shall continue to do, in what direction we are to look for the causes of such cases of hyperidrosis as may come

under our observation. It is only by research in this direction that we shall ever arrive at a satisfactory method of treatment. The local treatment, according to the routine of the books, is too often perfectly futile, and we should always endeavor to get at the underlying cause where this can be ascertained, although in the great majority of cases our efforts may be without result.

Affections of the sympathetic nerve may be accompanied by local hyperidrosis. Perroud (quoted by Bouveret[1]) reports the case of a woman of seventy-three suffering from bronchial catarrh who showed a pronounced facial asymmetry, with an erythematous redness extending over the entire left side of the face, which had a markedly higher temperature than the right side. The affected side was permanently moist with perspiration, which increased in quantity at times until it ran down the face in drops. The conjunctiva of the left eye had been markedly congested for some weeks and exuded from time to time a fine shower of blood without any perceptible fissure or excoriation. Sub- and periorbital pain usually ushered in this flow of bloody tears.

The sudoral hypersecretion does not always coincide with vasomotor paralysis. In one case of traumatic paralysis of the sympathetic, the left side, the seat of the traumatism, was warmer than the right, but showed no excessive perspiration. H. C. Wood gives the history of a case affected with abdominal growths probably involving the plexus of the abdominal sympathetic. This patient showed profuse unilateral sweating. Nicati notes that when the cervical sympathetic is paralyzed the first period is one of excitation, when the sweat secretion is diminished; the second, when the paralysis is fully established, shows the same symptoms regarding the effect on the sweat secretion as are noted after division of the cervical spinal cord, that is, marked hyperidrosis. In the third period atrophic lesions accompany the continued paralysis and the secretion of sweat is again diminished.

Hyperidrosis is observed in lesions of the cord, acute myelitis, etc., though the condition of the sweat secretion may vary at different periods and in different cases. Infantile paralysis, diffuse sclerosis, progressive muscular atrophy, tetanus, and tumors of the cord are all accompanied at times by changes in the sweat secretion. The same is the case in diseases of the brain centres, in alcoholism, and in hysteria.

Hyperidrosis unilateralis is not very uncommon. The entire surface of one side of the body and limbs may be involved, while the other side remains intact and normal.

Sometimes this sudoral hypersecretion is continuous, more frequently it shows itself under the influence of heat, exercise, emotion,

The *local hyperidroses* of the hands, feet, and axillæ are often due directly to nerve influence. Cases are well known where the exertion of eating has given rise to sweating over the parotid gland and elsewhere about the face.

Hyperidrosis of the palms and soles is the form of local hyperidrosis most commonly met with in practice. It is sometimes excessive. From the palms it may be so profuse that the fluid will accumulate in the hollow of the hand until it runs over the edge. Cutler[*] reports a case confined to the palmar surfaces of the hands and fingers. The affected parts were slightly cool to the touch. The skin was sodden, but not wrinkled like that of a washerwoman. The circulation was good, the nails red and normal in appearance. Both tactile and painful sensibility were normal, being the same in both hands.

Through a magnifying glass the skin seemed thickened, œdematous, and more translucent than normal, the capillary blood-vessels dilated, and the mouths of the sweat ducts widely open.

The quantity of the secretion was enormous. When the hands were held down with the fingers apart, drops of sweat would fall every second, forming pools of water on the floor. From one hand about an ounce of sweat could be obtained in five minutes. To prevent the sweat from ruining her dresses the patient had constantly to carry a handkerchief in each hand, and in an hour's time they were so saturated that water might be wrung from them. At night her hands had to be wrapped in towels to prevent the sheets from being wet through. With all this loss of water from the system the thirst was but slightly increased or the urine diminished. In this case treatment seemed of little avail.

The soles often show a severer form of hyperidrosis than the palms, the soaked epidermis becoming macerated and peeling off, leaving the tender skin exposed. The pain on walking is often so severe as to keep the patient off his feet.

In some cases, warty thickenings are observed on the palms as well as on the soles of the feet, the fingers are swollen like drum sticks, and the nails are large and broad. I have observed this condition gradually becoming more marked year by year in a patient who has been under my close observation for a long period. Here the hyperidrosis has always been kept under control, although not entirely abolished, but the gradual changes in the structures mentioned have continually made progress.

Lesser[*] says that there is some connection between the condition known as flat-footedness and hyperidrosis. Trendelenburg thinks that the connection is through the nerves; either there is some reflex

action, or there is a mechanical pressure upon the plantar nerve. Permanent flat-foot, Lücke thinks, occurs in persons of a venous habit, that condition which coincides with weak muscles, cold feet, and excessive perspiration. With muscular weakness the formation of varices may occur; not necessarily of the superficial veins but of the deeper veins, with, perhaps, thrombosis. In 189 cases of hyperidrosis pedum, of which 98 were male and 91 female, Lesser found that 51 per cent. of the men and 27.4 per cent. of the women were flat-footed. Varicose veins were found in 40.8 per cent. of the males and in 39.5 per cent. of the females.

I have not had my attention particularly drawn to this subject, but I may mention that in one case of my own, that quoted just above, flat-footedness existed, but not varicose veins.

According to Lesser, hyperidrosis of the feet is often hereditary. I have never observed this in my own experience, although I can recall one or two cases in which hyperidrosis of the axillæ and hands has appeared so. Lesser also says that increase of the hairy growth upon the limbs is usually accompanied by increased sweat secretion.

As regards the quantity of sweat poured out from the soles, a case of R. W. Taylor's is quoted by Cutler, in which the patient, a man, aged thirty-two, had suffered for years with chronic bronchitis and debility. He had never had any abnormal sweating. Upon a certain evening, about nine o'clock, he had an unpleasant encounter with the police, and became violently excited. Taylor found him about an hour later bordering on collapse. A cold perspiration covered the body; the pulse was small and rapid; the breathing slow. His hands and feet were extremely cold. The patient stated that after the fracas he became greatly exhausted, and among his other symptoms noticed that his legs and feet became the seat of profuse cold perspiration. At Taylor's direction his boots were removed, when it was found that his drawers and stockings were soaked with a watery fluid, and from the boots was poured a quantity filling a beer glass. This amount of sweat had been secreted in rather more than an hour. In a few days he had regained his usual condition of health.

The causes of hyperidrosis, other than those mentioned above, are not known. It affects the cleanly and the dirty, the healthy and the sickly alike, and is met with in persons of all ages and both sexes. In addition to diseases of the nervous system, debility, malaria, and occasionally functional or organic disease of the internal organs, as the heart and lungs, may give rise to hyperidrosis. The affection is aggravated by high temperature and is usually, though not always, worse in summer than in winter. Excitement of any kind, physical or mental, increases the flow of sweat.

Treatment.

The treatment of hyperidrosis must vary with the individual case. When the cause is proximately or exactly known, internal remedies appropriate to the general condition may be employed with good effect. If there be debility a general tonic treatment is indicated. Iron, quinine, strychnine, and the mineral acids, especially aromatic sulphuric acid, in doses of gtt. x. or xx. twice or thrice daily may be used to advantage. Atropine is the most efficient remedy, and may be used at first to gain time for the further investigation of a case or to introduce other treatment. Its effect is apt to be temporary, however; at least such is my experience. It may be given by the stomach in doses of gr. $\frac{1}{200}$ to $\frac{1}{50}$ dissolved in water three times a day until the physiological effects are produced. Or in some cases the hypodermic use of the drug may be found advisable in the same dose, only with more caution.

Aubert[1] says that when an alkaloidal solution is made to penetrate the cutaneous surface by means of a continuous electric current, the amount of sweat secreted is easily ascertained by the method of *empreintes sudorales*. By this method Aubert has ascertained several facts of therapeutic importance which may be mentioned here. He uses the positive pole to which a compress soaked with the solution is attached. He finds the negative pole nearly valueless for this purpose. Aubert's researches lead him to the conclusion that aconitine, atropine, daturine, homatropine, and hyoscyamine are markedly anidrotic.

These researches, although no practical results of the method have been published, are very suggestive; and this plan of treatment, lying as it does midway between the general and local therapeutics of hyperidrosis, merits an extensive trial.

Local treatment in the milder forms of hyperidrosis is particularly useful, and in some cases may alone be required. Patients are apt to use too much water, particularly warm water, in washing the parts too frequently. The parts affected should be washed as rarely as possible—only when they are positively dirty. They should be wiped, however, from time to time with a damp cloth and immediately dried with a soft towel without friction. Various dusting powders, as starch, lycopodium, magnesia, and oxide of zinc, or the same with the addition of half a drachm of salicylic acid to the ounce, may be used. The following combination is useful:

℞ Pulv. acid. salicylic.,
Pulv. zinci carb. præcip.,
Pulv. magnesiæ ustæ, ... ää ʒ iv.
Pulv. amyli, ... ʒ xv.
Pulv. cretæ, ... ʒ xx.
M.

The powder should be removed and renewed as soon as it becomes dry and caked.

Chloral in powder, in the proportion of one drachm to one ounce of starch powder, is one of the most efficient of all these powders. They are ordinarily serviceable only in mild cases. Slight cases of hyperidrosis may also often be cured by the use of juniper tar, carbolic acid, and sulphur soaps. Lotions containing alcohol alone or with the addition of some astringent will be found useful. The following is a convenient formula:

℞ Acidi tannici, ... ʒ i.
Alcoholis, ... fl. ʒ viij.
M. Sig. Use as a lotion.

Salt baths are sometimes found serviceable. Tincture of belladonna, diluted or in full strength, may be employed, its constitutional effects being guarded against. Weak solutions of chloral, permanganate of potassium, and salicylic acid have been employed with success. In hyperidrosis of the palms and soles, washing with carbolic acid or juniper tar soap may be followed by the application of the following ointment, spread upon cloths and kept in place with a bandage:

℞ Ung. picis (U. S. P.),
Ung. sulphuris (U. S. P.), ... āā ʒ ss.
M.

In obstinate and severe cases, especially when the soles of the feet are affected, Hebra's treatment is an excellent one. It is as follows: The parts having been cleansed with soap and water, the following ointment is applied:

℞ Emplast. diachyli,
Olei olivæ, ... āā ʒ ij.
M. The plaster is to be melted and the oil added and stirred until a homogeneous mass results.

Pieces of muslin or cotton cloth are to be cut to the size of the parts, and the ointment is spread on thickly and applied. Lint smeared with the ointment should also be placed between the toes (or fingers) so that every portion of the skin may be completely covered with a layer of the ointment. The dressings are to be bound down closely by means of a bandage. The cloths are to be changed twice in the twenty-four hours, when the parts are *not* to be washed but simply to be rubbed dry with lint and powdered starch dusted on, after which fresh dressings are to be applied in exactly the same manner. This treatment is to be continued from one to several weeks according to the severity of the case. Even when the disease is on the soles the

patient may be permitted to walk about in loose shoes. At the expiration of eight or ten days the parts are to be rubbed with the dusting powder and the dressings discontinued.

The powder should be used for several weeks longer. Usually the sweating tends to lessen and gradually disappear after two or three weeks from the beginning of the treatment. A repetition of the course in severe cases is sometimes necessary before attaining a complete cure.

Of course the patient must give up his occupation while undergoing this treatment—a sacrifice of time which is impossible in many cases. Where, however, circumstances will permit, the treatment just described will succeed when milder measures, however faithfully applied, have failed.

Ohmann-Dumesnil employs the following method with success: The affected portions are thoroughly cleansed in a slightly astringent solution, say a scruple of tannin to two pints of water. If there be fœtor, the addition of salicylic acid is indicated. After washing, the soles and heels should be well dried. Previously to this strips of adhesive plaster (the old-fashioned diachylon) should have been prepared. These are snugly fitted to the dried parts, the stockings are pulled over and the shoes are put on. The patient will be immediately enabled to walk with comfort. This dressing is to be repeated three times a week. In two or three weeks complete relief is obtained, in mild cases, the time required being in direct proportion to the severity of the symptoms. The manner of recognizing a cure is by the yellow color of the epidermis, which will have thickened. Where there is any tendency to bromidrosis the shoes should be disinfected.

The chromic-acid treatment employed in the German army has been opposed on account of a supposed danger of poisoning. Recent statistics, embracing no less than 36,240 soldiers thus treated, partly as a prophylactic measure, show that with reasonable care no untoward result need be feared. In a number of cases where there were open cracks in the soles and between the toes, and when strong solutions had been employed, the foot swelled and an eruption of blebs appeared, spreading over the foot and leg. In one case there was temporary albuminuria.

The method followed consists in first bathing the feet in hot water with soap to remove all dirt and sweat secretion, and then pencilling the soles and, lightly, between the toes with a one- to five-per-cent aqueous solution of chromic acid. The patient should rest for twenty-four hours after the operation, or at least should not take active exercise.

The application colors the skin a yellowish brown. In a few minutes the skin is dry and the stockings and shoes may be put on. When there is a tendency to cracking and fissures, an ointment composed of half a drachm of salicylic acid or a drachm of boric acid in lanolin or mutton suet may be rubbed in.

Sometimes a slight pricking, itching, or burning sensation is felt for some hours or even a day or two, but this can easily be borne. The applications need be made only about once in a week or ten days. I have found this treatment very satisfactory, but it must not be carried too far or hardening and cracking of the epidermis will follow. I have employed it only in plantar hyperidrosis, but I can see no reason why it may not be used in any localized form of the disease. Especial care must be taken, however, in making chromic acid applications to the palms for fear of disabling the patient by the thickening epidermis. Perhaps a one-per-cent. solution would be strong enough in these cases.

I may add here two suggestions from Unna regarding the different kinds of treatment appropriate to warm congestive sweating on the one hand, and to cold, soggy sweating on the other. The hands are more liable to the hot congestive variety while the feet are more apt to be pale and cold.

In congestive sweating Unna counsels lukewarm baths followed by inunctions with the following ointment:

℞ Ichthyol,
Water, ... ää ʒ ij.
Lanolin, ... ʒ i.
M.

This may be applied at night and then washed off on the following morning with superfatted ichthyol soap, a small portion of the suds being allowed to dry upon the surface.

In the cold, soggy variety of hyperidrosis Unna recommends hot baths with the addition of tincture of camphor, vinegar, mustard, or some similar rubefacient and subsequently inunction with the following ointment:

℞ Ol. terebinthinæ,
Ichthyollis, ... ää ʒ iiss.
Ung. zinci oxidi, ... ʒ v.
M.

This application is made in the evening, and the following morning the parts are to be cleansed with soap and then frictions with ice water are to be made.

The *prognosis* of hyperidrosis depends somewhat upon the state of the patient's health, the duration and locality of the disease, and

its extent. Many cases are easily cured while others are extremely intractable. The ability of the patient to follow the treatment must also be considered, as careful attention to the minutiæ of each procedure is absolutely requisite.

Bromidrosis.

The term bromidrosis is employed to signify that under various conditions the secretions of the skin, which in health are almost inodorous, become remarkably tainted and offensive (Foote [9]).

1. The body may give out a disagreeable odor as the result of the introduction into it, in the form of food or medicine, of some substance which may be itself inodorous.

2. The odor given forth may be the indication of some disease existing and progressing internally, some of whose products or results are carried outwards, dissolved in the perspiration or sebaceous secretion.

3. The cause may be unknown or very obscure, and this form which is perhaps the most common, is often long and unsuccessfully treated.

The human perspiration, at least in the white race, in a state of health is inodorous, but under certain dietetic conditions, as the ingestion of asafœtida or of large quantities of garlic, onion, leek, whale oil, etc., it assumes a peculiar and characteristic smell. During the administration of certain drugs, as phosphorus, sulphur, and tellurium, the compounds of hydrogen with these substances are emitted from the skin in an unmistakable manner. That the exhalations of the lungs are not alone impregnated with these gases is proved by the fact that silver articles become blackened in the pockets of persons undergoing a course of sulphurous medication.

Alcohol, coffee, truffles, valerian, musk, turpentine, tar, the ethers, benzoic acid, iodine, etc., may be added to the list above mentioned. The odor of copaiba as exhaled by the skin is highly characteristic.

Professional odors of the skin may be mentioned here. "Odorless excavator" workmen, coopers, tanners, butchers, soap-boilers exhale each his characteristic odor. That of stablemen is sometimes so persistent that after six weeks in an hospital the characteristic smell may be perceived.

Persons suffering from incontinence of urine exhale a mousey odor, in chronic constipation a fecal odor is perceived, and even the well-known "ward-smell" of hospitals is characteristic of the cutaneous emanations of the patients. Wards filled with women and children smell of butyric acid, while men's wards have an alkaline ammoniacal odor. The various diseases as gout, cholera, typhoid and typhus fevers, etc., have their characteristic odors.

Not all of these odors can be classed strictly as offensive, but they are abnormal and should be considered under the same head.

The hair of the scalp possesses an odor which may be called normal. It differs in different races. In the Chinese it is decidedly musk-like even when no cosmetic has been used.

When the hair falls it loses its odor, so that wig-makers can recognize by the smell whether a given sample has been cut from the scalp or is derived from dead hair. In hysteria and especially in hystero-epilepsy the hairs take on a peculiar ozone-like odor, like that of a frictional electric machine.

In rare cases the odor of the body is agreeable, resembling violets, banana, orris, etc. All these odors are, like those of bromidrosis, derived from the decomposition of fatty acids in the sweat. The fact that such odors are connected with the perspiration shows that Unna's view regarding the oil-excreting qualities of the sweat glands is correct, and that the term *coil* glands would be more appropriate.

Treatment.

In practice bromidrosis is commonly found confined to the axillæ or to the soles, and is usually, especially in the latter case, concurrent with hyperidrosis. Measures for the relief of the hyperidrosis must therefore usually accompany any effort to remove the offensive odor.

Some patients suffering from bromidrosis demand general tonic and hygienic treatment to raise the whole tone of the system. In addition, when there is much sweating, the following formula will be found useful:

℞ Acid. sulphuric. aromat., ... fl. ʒ vi. ad x.
Aquæ, ... q.s. ad fl. ℥ iv.
M. Sig. A teaspoonful in a wineglass of water three times a day.

Atropine may also be given, when the sweating is a marked feature, in doses of gr. $\frac{1}{200}$ to $\frac{1}{100}$:

℞ Atropin. sulphat., ... gr. ½.
Aquæ destillatæ, ... fl. ℥ iv.
M. Sig. Half a teaspoonful to a teaspoonful three times a day.

Salicylate of sodium in gr. v. to x. doses has cured some cases.

Crocker recommends a level teaspoonful of precipitated sulphur in milk morning and evening, or when this purges it may be combined as follows:

℞ Pulv. cretæ comp., ... ʒ vi.
Pulv. cinnamomi comp., ... ʒ ij.
Sulph. præcipitat., ... ℥ i.
M. Sig. A teaspoonful to be taken twice a day.

As regards local treatment, that used in hyperidrosis may be employed and in addition the following:

For bathing the feet Fox recommends a one-per-cent. solution of chloral or permanganate of potassium. It should be applied with as little friction as possible and allowed to dry on the skin, or the excess of moisture may be removed by the pressure of a soft warm cloth.

Ainsworth recommends the application of the following powder:

℞ Pulv. aluminis ustæ,	ʒ xx.
Pulv. acidi salicylici,	ʒ iv.

M.

Thin, of London, after a careful study of the subject of bromidrosis pedum, found the moisture which collects in the patient's stocking to be of an alkaline reaction and swarming with bacteria. This fluid acts as an irritant to the skin and greatly aggravates the disease. As a parasiticide application and one calculated to allay the irritation of the skin he recommends the use of boric acid. The stockings should be changed twice daily, and the stocking feet put to soak for some hours in a jar containing a saturated solution of boric acid. They are then dried and may be worn again, the odor having disappeared.

To prevent the fetid perspiration soaking into the soles of the shoes, and thus giving rise to a permanent stench, cork soles are to be worn during the day, and soaked overnight like the stocking feet in a jar of boric-acid solution.

In obstinate cases of bromidrosis pedum it may be requisite to try one after another various external applications. I therefore subjoin several additional formulæ.

The following may be used to precede the astringent powders:

℞ Sodii biboratis,	ʒ ss.
Chloral. hydrat.,	ʒ i.–ʒi.
Aquæ fœniculi,	♁ ij.

M.

In bromidrosis of the axilla sponging with pure alcohol followed by inunction with a ten-per-cent. oleate of mercury ointment has been found useful.

Tshappe recommends the following:

℞ Zinci sulphatis,	
Ferri sulphatis,	ää ʒ xiv.
Cupri sulphatis,	ʒ iv.
β-Naphthol,	gr. xv.–ʒ i.
Essence thym.,	ʒ ss.–ʒ i.
Acidi hypophosphorosi,	gr. xv.–ʒ i.
Aquæ destillatæ,	♁ vss.

M.

Of course medicated soaps should be employed when soap is necessary. Tar, carbolic acid, salicylic acid, boric acid, and sulphur soaps are the most desirable forms.

Like that of hyperidrosis the *prognosis* of bromidrosis is very uncertain. Most cases can be mitigated and the condition of the patient much ameliorated by persistent treatment. A perfect cure is somewhat exceptional, except in those cases where the bromidrosis is the result of some intercurrent condition of the general system which itself can be relieved.

Chromidrosis.

We owe our first systematic knowledge of this condition to the persistent observation and publication of facts by Leroy de Méricourt, who persisted in the face of ridicule and opposition on the part of those who believed that all such cases were factitious in demonstrating the existence of the affection as a true functional disorder of the coil glands.

There is some confusion with regard to the different varieties of chromidrosis, some of which perhaps should hardly be entered under the head of diseases of the sweat glands. I shall, however, consider them all under this head, indicating in the proper place any doubts which may exist regarding the true nature of the respective affections known by this name.

Black and Blue Chromidrosis.

Typical chromidrosis is that of the black, blue, or gray varieties. The symptoms of its appearance are as follows (Parrot[9]):

Without any appreciable cause or perhaps more frequently under the influence of some menstrual disturbance, moral emotion, or intense heat, the lower eyelids, more frequently attacked than other regions, become swollen, congested, and painful, while a blackish or bluish patch of variable area shows itself, which at first is rather light in tint but soon becomes darker and spreads over the entire surface of the lid. Occasionally the discoloration extends no farther for some time, and it may even remain confined to the lower eyelids; but in most cases it spreads beyond this limit and invades the cheeks and forehead, affecting particularly the edge of the hairy scalp, and may also involve the nostrils, the lips, and the whole face to the ears. At times even the neck, the thorax, and the abdomen may be involved. In these latter regions the exudation is ordinarily less abundant and less deeply tinted than on the lower eyelids, and when the affection begins to subside, these parts are the first to improve and the affection recedes in the same order as it first invaded the several parts. This

form of chromidrosis is almost invariably symmetrical. In general the skin is hyperæsthetic and even quite painful.

The series or gamut of color tones is quite an extensive one, the discoloration varying at different times and in different cases from light blue to jet back. Sometimes the skin shows only a slight smoky color, at other times and when the affection is extensively diffused the patient's skin looks like that of a Guinea negro. Of all the various shades indigo blue is that most commonly displayed. More rarely a yellowish or ochreous tint is observed like that of iron rust.

Two circumstances seem to cause a variation in the tint of the exudation: its thickness and the action of the air. The longer the discoloration has lasted the darker it is.

When this form of chromidrosis is slight and makes its appearance on the lower lids only in a brunette young woman, it seems hardly to do more than to heighten her beauty; but this is rare, and more frequently the appearance presented is so grotesque as to be little less than a calamity—so much so that women thus affected live in seclusion and only venture out thickly veiled. This circumstance militates strongly against the view that the condition is one which has been artificially produced. Nevertheless, it is easy to take this view, and I have sometimes hesitated, when the patient was distinctly hysterical, before giving up the hypothesis of a factitious eruption.

The appearances presented by the patches of this form of chromidrosis are variously described by different observers. Sometimes the appearance is said to be that of a fine charcoal powder dusted upon the skin. At other times the appearance is that of minute grains of a grumous blue or black tint, occasionally isolated and distributed regularly so as to indicate the glandular orifices. Sometimes they are accumulated in the flexures of the skin, notably in those of the eyelids where this arrangement is very conspicuously displayed when the lids are closed or stretched out by the fingers.

In some cases the black deposit, or rather exudation, is shining and seems to be formed of some oily or greasy material almost like blacking or a mixture of suet and lard containing lampblack. In one case reported, the discoloration, both by its color and its localization, suggested the mask of pregnant women (*chloasma uterinum*). Ordinarily the hairs are not affected; however, in a case reported by Lecat, the hairs at their roots and for several millimetres of their length seemed to be swollen and filled with a black fluid.

The coloring matter is closely adherent to the skin, and all observers agree in stating that it is removed only with difficulty. However, by friction some portions of it can be detached and it stains the linen with which it may be in contact. Water alone will not cleanse the

integument even with the aid of vigorous rubbing. Glycerin, somewhat more efficacious, leaves a bluish stain upon the skin, due to numerous black points which, as Leroy de Méricourt says, gives the skin the appearance of the freshly shaved chin in a heavily black-bearded man.

By the use of oil, however, according to the same author the skin can be rapidly and completely cleansed so that even with a strong lens no sign of discoloration can be perceived. I have not been so fortunate, as I have found the follicles to remain marked as minute black points even after prolonged rubbing with oil.

Cases have been reported where the dark exudation has spontaneously and completely disappeared under the influence of profuse diaphoresis induced by morbid or normal means, such as menstruation, lying-in, a fever, or a visceral hemorrhage. Such cases, however, are extremely exceptional, and almost always the skin is restored to its natural appearance only by artificial means. When cleansed in this manner, if the disease continues its natural course the exudation is sure to reappear, in a period varying between a few minutes and several days, and its mode of appearance, its extension, its color, and its amount are usually about the same in each attack.

The coloring matter forming the exudation in chromidrosis has been made the subject of careful examination by many investigators. It differs essentially in chemical constitution from the various dark or black powders, mineral or vegetable, as charcoal, soot, lampblack, etc., with which the skin might become covered accidentally or with intent to defraud. On the other hand, it presents numerous analogies both in its form and microscopic appearance to certain products of the animal economy of pathological origin commonly known as melanosis.

If the coloring matter is collected shortly after its secretion and mixed with a sufficient quantity of glycerin it is seen to be made up of corpuscles of greatly varying dimensions, lamellar in form, resembling fragments of dried varnish recently detached from a smooth surface or rather minute *bâtonnets*. On moving a cover glass over the aggregation of corpuscles these forms are seen to be regular and constant and not merely fortuitous. If the coloring matter has not remained too long in contact with the air, the greater number of these corpuscles are seen to be of a deep indigo blue, almost black excepting at the edges, where they are clear, transparent, lighter blue. According to Ordoñes other matters are found in the exudation as follows:

1. Cells belonging to the internal epithelial lining of the sebaceous glands of the palpebral region, not differing from the normal cells

excepting by the dark-brown color of the oil globules which they contain; 2. Small groups of amorphous hæmatosin, crystallizing in a characteristic manner under the influence of sulphuric ether.

The black matter of chromidrosis is almost insoluble, but it may be dissolved in strong sulphuric acid, and the addition of cyanide of potassium with proper precautions shows the presence of iron.

It cannot be mistaken for lampblack, for this is granular and never contains lamellar tabellæ. In finely ground charcoal which most closely resembles it, a careful examination will show some minute fragments displaying symmetrical lines which indicate the succession of carbonized vegetable cells.

The localities where chromidrosis is situated frequently display other eruptive manifestations, such as erysipelas and acne rosacea, either intercurrent or concurrent with the discoloration.

Symptoms.

The general symptoms which occur in connection with chromidrosis are almost always of a neuropathic character. Independently of the hyperæsthesia above mentioned, cephalalgia, gastralgia, and sharp thoracic pains precede or accompany at times the eruption. In the case of a young girl of nineteen Warlomont observed a cutaneous and mammary hyperæsthesia accompanying swelling of the breasts and ejaculation from the nipple of a yellowish fluid. At the same time blue patches appeared upon the surface of the breasts which within a quarter of an hour became confluent and extended to the hypochondrium and the epigastrium. The exudate was of precisely the same character as that which appeared upon the eyelids.

Most commonly the nervous disturbances accompanying chromidrosis belong to the category of hysteria. Sometimes these are sensorial or sensory, sometimes they take on the form of convulsive attacks, not excepting hystero-epilepsy or even true paralysis. In a few cases transitory mental disturbance has been noted.

Chlorosis, characterized by pallor of the skin, palpitations, sensations of suffocation and syncope, are common in such cases. Menstrual disturbances are not infrequent, but have not the causal importance which has been sometimes attributed to them. In amenorrhœic women the appearance of the exudate marks the epochs or their intervals. When menstruation is regular the exudation appears just previously, and ceases with the period. This connection of chromidrosis with the menstrual period has frequently been observed. In normal women it will be remembered that the lower lids are often engorged with bluish blood and darkened during the menstrual period, and that tonic and hygienic measures may cause the disappearance of this

condition, which is rather a pigmentary deposit than a colored excretion. Fonssagrives reports a case where, one or two days before the menstrual period, hysterical symptoms appeared, the eyelids became swollen and closed, and thousands of minute vesicles of eczema developed upon their surface. The flux once established, the vesicles dried up and a marked brownish discoloration succeeded which lasted until the next menstrual period.

The respiratory organs are also involved in some cases. There is a dry cough of a convulsive and extremely fatiguing character. The digestive organs are sometimes implicated also. Vomiting of matter of a sanguinolent character has been noted as well as the ejection of the same coloring matter as that found in the chromidrosis. The nasal fossæ, the bronchi, and the kidneys also at times show traces of the coloring matter. In a case occurring under Mr. Teevan's care it was observed that when the coloring matter appeared in the blood furnished by the visceral hemorrhages it did not show itself upon the skin.

Course and Duration.

The course of chromidrosis has been sketched above. As to its duration, the affection may reach its utmost extension in a few days or it may make much slower progress. Occasionally it pursues an intermittent course. Perhaps we may place the total duration of the affection at from several months to many years. One case was ten years under observation.

Etiology.

The influence of sex is considerable in the etiology of the disease. Men are only rarely affected. Age also is an important factor; chromidrosis is a disease of the young, occurring between the ages of fifteen and thirty. Among the predisposing causes may be mentioned a nervous constitution and menstrual disorders, although these latter are by no means constant.

Among the exciting causes moral impressions, particularly those of a painful character, occupy a prominent place. One patient when spoken to in a manner to excite emotion blushed blue instead of blushing red. Such influences are particularly powerful at the menstrual epoch. In a case reported by Lecat, the colored exudation appeared in a pregnant woman at about the same period when the ordinary brownish mask is commonly observed. In men violent chagrin, watching, overwork, etc., have usually been observed among the exciting causes. Exposure to fire, extreme cold, or the extraction of a tooth has been known to produce the coloration.

With regard to the pathogenesis of chromidrosis, very few indications have been furnished by the cases recorded. Billard supposes that the coloring matter is contained in the blood, and that this is separated by the glands in the sweat. Chromidrosis is then a functional disorder of the sweat glands. At least this is true of blue and black chromidrosis, which is, it will be remembered, the variety under discussion. Neligan and Wilson, thinking that the coloring matter is secreted by the sebaceous glands, gave this affection the name of *stearrhœa nigricans*, but the researches of Unna having demonstrated that the sweat glands (or coil glands as he proposed to call them) also secrete oily matter, we need not consider the sebaceous glands as at all necessarily involved. It seems to me likely that the sweat charged with indican, or whatever the blood product may be, coming in contact with the oily matter of the coil glands as the two secretions mingle at the mouth of the sweat ducts, a chemical transformation takes place giving rise to the chromidrotic exudation as observed on the surface.

I may recall in this connection that the "black head" which marks the point of the comedo in that affection of the sebaceous glands is not deposited dirt as was formerly supposed, but is a bluish-black discoloration also supposed to contain indican, and I would suggest that these black points may have the same origin as the secretion of chromidrosis.

Diagnosis.

The diagnosis of chromidrosis should not in most cases present serious difficulties. In the first place, we have a black or bluish-black substance upon the surface of the skin; and in the second place this substance has not been deposited from the atmosphere nor has it been placed there by design. It is a secretion of the glands. In order to ascertain if we have a case of true chromidrosis before us, the part affected should be thoroughly rubbed with a piece of rag dipped in oil. If this does not become covered with black particles the chances are that the case is not one of chromidrosis. The presence of black coloring matter upon the rag does not, however, prove that chromidrosis is necessarily present, because coal dust, soot, or some blue or black coloring matter may have come in contact with the skin by accident or design. The presence of certain general symptoms, the neurotic diathesis, hysteria, etc., is presumptive evidence; but to make sure, a chemical and microscopical examination of the exudate or deposit should be made. The method of making this and the appearances to be expected have been described above.

Treatment.

The local treatment of chromidrosis is in general palliative only. In a light case recently under my care, where a single patch, half an inch wide by three inches or more in length, existed on the right cheek, a thorough cleansing with a one-per-cent. corrosive sublimate soap together with tonic internal treatment removed the patch permanently. In severe cases we must gain time by daily cleansing with oil and build up the patient's health by tonic medicines and careful hygiene.

GREEN CHROMIDROSIS.

Halford [10] reports a case of green chromidrosis occurring in a young lady fourteen years of age who for some months had evinced much general debility when she was seized with an attack of rheumatic fever, which yielded to remedies slowly and unsatisfactorily. After some days, during which perspiration was considerable, Halford's attention was called to a collection of light green perspiration between the toes and underneath the nails of the young lady's feet, whilst the same appearance was observable in a fainter degree on the upper but more especially the under surface of the foot. Chemical examination showed the color to be due to copper, derived, as it was subsequently ascertained, from food impregnated with the metal from copper cooking utensils. Workers in copper are also at times subject to a similar form of chromidrosis.

YELLOW CHROMIDROSIS.

White [11] reports the case of a German, twenty years old, in apparently perfect health. He was a light blonde and of a fresh color. He had been working in a sugar factory. For six months previously to the date of his examination, he had noticed that the left side of his shirt was constantly stained with a yellow color, and that the ordinary processes of laundry washing did not wholly remove the color from the underclothing so that it became more and more deeply stained. He, as all workmen in this employment, was accustomed to sweat profusely during his working hours over the whole surface, but not more freely upon the left side, according to his observation. He was somewhat alarmed at his condition, but felt well in all other respects, and there were no abnormal sensations upon the affected side of the body nor in the skin covering it.

A week before the patient saw Dr. White he had put on a new shirt which he had worn continuously ever since. It was stained a bright saffron color upon the left side from the shoulder down to the end of the flap. The stained portion had a somewhat trans-

lucent, greasy look. The skin of the corresponding regions presented no abnormal appearances, and was of a natural color. According to the patient's report, it never became more yellow than other parts of the surface. The patient had bathed infrequently, but no amount of extra washing with soap since the appearance of the trouble had seemed to control it even temporarily. The man was kept under observation two weeks without treatment and the clothing continued to be stained as before. Under the use of an ointment of salicylic and boric acids the trouble disappeared in the course of ten days and did not return. Chemical examination failed to throw light upon the nature of the coloring material.

Other cases of genuine yellow chromidrosis have been reported, but the following one of an accidentally factitious character may be mentioned here with the view of placing the observer upon his guard: Demons [13] reports the case of a priest who after a long sermon preached on a very warm day found that his chest was covered with an abundant yellow perspiration. The same symptoms appeared during the two succeeding nights. It was found to be due to the dye coming off from the aniline yellow lining of a scapular.

Red Chromidrosis.

Red Chromidrosis, properly so called, is not, strictly speaking, a coloration produced originally in the sweat secretion. Most of the reported cases of red or orange sweat turn out to be in reality parasitic affections of the hair or epidermis. The affection is sometimes known as lepothrix. In cases which I have examined the bead-like nodules have been of a red color. The affection is usually seated in the axillæ. Leroy de Méricourt reports a case of rose-colored eruption upon the cheek and neck in a boy of twelve, so profuse as to stain the collar red. With a lens reddish granules could be perceived between the layers of the epidermis; subsequently bluish areas appeared on the periphery of the red patches. Andrés [14] reports the case of a young man of twenty-two, not hysterical, who was affected with a red or rose-colored transudation on each wrist and under the finger nails. A microscopic examination showed it to be composed of reddish granules isolated or mingled with epidermic cells. I have in several cases observed a similar condition about the face.

Bergeron, Leroy de Méricourt, and Déchambre [15] have described cases of this affection and the causes which produce it, and also various attempts which have been made to imitate the condition by patients with the intention to deceive.

In Germany Hoffmann [16] and Pick appear to have been the first to show that red perspiration is produced by the development of

microbes which attach themselves to the hair of the axillæ, forming glutinous yellowish-red masses. These researches were subsequently completed by Babes."

Balzer and Barthélemy [17] have more recently published researches going to confirm the facts before cited. They refer to a case coming under the observation of Babes in which a woman twenty-six years of age complained of itching in the right axilla. On examination the part was found red and tumefied, and both the hairs of the axilla and the patient's linen were uniformly covered with a red stain, varying from brick-red to blood color. The patient menstruated irregularly and was nervous. The red perspiration was most abundant at the menstrual period. The perspiration itself was found to have the same coloration. Babes observed a similar condition in a perfectly healthy man. In addition to finding the same microscopic appearances as those obstained by Balzer and Barthélemy, which will be noted later, Babes notes particularly the various microchemical and spectroscopic reactions shown by the red chromidrosis. The spectral lines, he says, differ essentially from those produced by aniline colors and resemble those shown by the Micrococcus prodigiosus. Cultivation produced red zoöglœa masses like those observed in the sweat.

The case observed by Balzer and Barthélemy was that of a man of thirty-four, arthritic, subject to lithæmia, and of nervous temperament. He was subject to hyperidrosis, which in the axillæ took the form of bromidrosis. The patient, who was overworked, noticed that when extremely fatigued the perspiration became more profuse and malodorous. Subsequent to an attack of typhoid fever the hyperidrosis became more marked about the forehead, the scrotum, and the axillæ. It was in the latter locality only, however, that chromidrosis developed at this period. The color was brick red or brownish-red and covered a palm-sized area in each axilla.

The hairs were much changed from the normal. They were originally brown but now presented a reddish color with the fiery reflection of a red-haired person. In addition they had lost their natural softness and had become rough, harsh, and brittle. The cortex was rugous with a beaded look, and the hairs seemed to be surrounded by a sort of coating of unequal thickness which seemed to give the red color to the hairs and linen. When removed by washing, etc., these agglomerations rapidly reformed about the hairs. Various applications were made with a view to removing the agglomerations, such as alcohol, borax, salicylic and carbolic acids, etc., but without avail. Ether, however, removed all discoloration, which did not return again for some time.

Balzer and Barthélemy examined a number of similar cases, mostly occurring in lymphatic and arthritic individuals subject to profuse sweating. Having secured an abundance of material they proceeded to examine the diseased hairs. Having removed all oily matters by alcohol, some of the hairs were immediately mounted in glycerin or in balsam, while others were placed in various coloring solutions, such as violet, eosin, quinoline blue, etc.

Under a low magnifying power the hairs could be seen enveloped in yellowish or reddish masses placed at intervals, leaving the naked hair between so as to cause it to resemble a knotted cord. These masses presented a striated appearance, the striæ converging towards the hair. Between these striæ a glutinous and amorphous substance could be perceived, which was particularly noticeable about the free border of the masses.

Under a high power the striæ could distinctly be seen to be composed of chains of micrococci of a round or elliptical form, often colorless at the border of the zoöglœa, but presenting elsewhere a yellow, brown, or red color.

These micrococci were immersed in an amorphous and homogeneous substance which constituted their glair and which agglutinated them into zoöglœa. The glairy substance was also colored and contributed to give to the parasitic masses their special coloration.

Although the zoöglœa masses were generally attached to the cortex of the hair, the latter occasionally became disintegrated, allowing the parasite to invade its inner structures.

Not only were these microbes found upon the hair, but scraping revealed them also upon the surface of the epidermis, into which, however, they had not penetrated. They could likewise be found in the linen discolored by perspiration. In addition to the microbes above described the axillary epidermis was also found to contain numerous microbes, "*bâtonnets*," and micrococci which appeared to belong to other species than the microbes of chromidrosis.

Balzer and Barthélemy also state that parasitism of the axilla is quite common, as well among the scrupulously clean as among those of indifferently cleanly habits. But this parasitism is by no means invariably accompanied by red coloration. There may be only a slight yellowish color or no coloration at all. If in these cases the parasitic masses attached to the hairs are examined they are found to present the appearance of a dried, gummy substance.

Under the microscope the zöoglœa are absolutely identical with those already described, with this difference only, that they are slightly yellow or quite colorless.

Abundant perspiration evidently favors the multiplication of the

red microbes but does not necessarily induce their production. It is probable that the composition of the perspiration is of great importance in this connection. We have not, however, any certain data upon this head, and it must not be forgotten that the coloration of the micrococci appears to be, up to a certain point, independent of the locality of their development.

Babes thinks it possible that the affection is transmissible by contagion, but Balzer and Barthélemy think it unnecessary to invoke this method of development for parasites so generally distributed. I am inclined to agree with this latter view, for we know how many affections of the skin—as eczema in some of its forms, acne, furuncle, impetigo and ecthyma—are produced by parasites which are present in the epidermis under all circumstances and in most if not all individuals. A change in the character of the secretions affords an opportunity for development, and the germs of disease instantly spring into vitality. In fact Balzer and Barthélemy have found similar zoöglœa to those above described in scrapings from the epidermis of the inguinal and perineal regions. The hairs also of these regions as well as of the beard are likewise at times found covered with masses of the same zoöglœa.

Somewhat curious is the case of chromidrosis reported by Temple.[18] It was that of a man of sixty suffering from syphilis who took for a week iodide of potassium in two-grain doses three times a day. At the end of the week the patient's whiskers and hair, formerly nearly white, had assumed a fine magenta color. His shirt seemed to have been dipped in the same dye, which remained fast in spite of repeated washings. The color was secreted by the sweat glands visibly, his handkerchief even being stained when he wiped the sweat from his forehead. When the dose of iodide was reduced the stain lost its intensity, but as soon as the original quantity was again given the color increased. The hair did not regain its natural hue for some weeks after the use of the drug was discontinued.

This case, although I think unique, seems more like a true red chromidrosis than those usually described as such.

Treatment.

The treatment of red chromidrosis depends upon the realization of the fact that we have to deal with a condition of the general system which favors the development and growth of the parasites which give rise to the discoloration.

A general hygienic and medical course based upon a careful study of the patient's general condition must form an important part of the cure. Of course local parasiticide remedies must not be neglected.

The surface may be washed with a bichloride of mercury soap and then sponged off with a mixture of alcohol and ether. After this a dusting powder or lotion containing europhen, salicylic or boric acid, or bichloride of mercury 1:1,000 may be employed.

Uridrosis.

Uridrosis is due to excretion of urinary constituents, especially urea, by the skin. Urea is a constant constituent of the sweat in small quantities, but in disease may increase so much that in certain cases white crystals like hoar-frost have been deposited on the body. In uridrosis these crystals are mixed with epidermic scales, fine hairs, with a greater or less quantity of fatty matter, and sometimes with chloride of sodium. This crystallization is usually preceded by abundant sweating of a viscous yellowish character and greasy to the touch, as are all fluids containing urea. The sweating of urea appears first upon the face, forehead, temples, and most commonly about the roots of the hair. Subsequently the neck, the upper part of the chest, and the corresponding parts of the arms are affected, more rarely the back or abdomen is when the crystals are generally distributed. In rare cases the uridrosis is disseminated, but the palm and sole are never affected. In fatal cases of Bright's disease, the crystalline deposit becomes liquefied just before or within a few hours subsequent to dissolution and forms a viscous yellowish liquid spread over the surface of the body like a varnish.

The efflorescence of urea is caused (at least in Bright's disease) by a more or less complete anuria or a retention of urine of some days' duration and is the consequence of a saturation of the blood. According to Djovitch,[1] the greasy exudation of urea probably proceeds from the sebaceous glands, although it is not unlikely that it may proceed from the sweat glands also. As regards the latter I am inclined to agree with Djovitch. It is true that the absence of urea deposit upon the palms and soles, where the sweat glands are numerous and the sebaceous glands properly so called are absent, seems to point to the sebaceous glands as the source of the urea. But it must be remembered that the sweat or coil glands also secrete sebaceous matter, so that in this affection, as well as in some of the others I have described above, we have the sebaceous as well as the sweat secretions to deal with.

Uridrosis has been observed exceptionally in intestinal occlusion, in scarlatinous nephritis, poisoning by phosphorus, acute myelitis, and cancer of the uterus. Most frequently it is met in connection with Bright's disease, cholera, typhoid, and suppurative nephritis.

It is usually a symptom of bad omen. Djovitch says its prognosis is fatal, but I believe that it may occur, at least in a modified form, without such serious import. In fatal cases it precedes death by only a few days. Djovitch himself, however, observed one case in a child of five years suffering from scarlatiniform nephritis where recovery followed even after the occurrence of uridrosis.

Phosphoridrosis.

Phosphorescence of the living human body is a phenomenon of rare occurrence. It has been observed in some cases of miliaria and after eating phosphorescent fish. Panceri[30] mentions the case of a Neapolitan physician who had eaten of fish and afterwards experienced malaise and nausea with the phenomenon of luminous sweat. Panceri attributed the phosphorescence of the sweat to the elimination of the fatty matter of the fish upon which the physician was making experiments. Koster[31] records a case where the body linen became luminous after violent exertion.

Marsh[32] records the following striking case: A lady suffering in the last stages of phthisis displayed during sleep a luminous appearance which was at first thought to be the glancing from a light in the sick-room. The candle being shaded the observer still perceived the luminosity. It gave the face the look of being painted white and highly glazed, but it danced about and had a very extraordinary effect. The phenomenon was repeatedly observed during the last few nights before the patient's death, and was accompanied by a peculiar odor of the breath, probably alliaceous.

Marsh refers to a similar case reported by Donovan, the luminosity being compared to the light of the aurora borealis or to the scintillations of sparkling phosphorescence sometimes exhibited by sea infusoria. Donovan was of the opinion that the appearances witnessed were dependent upon the presence of phosphorescent matter in the expiratory and perspiratory secretions. The property which phosphuretted hydrogen has of undergoing spontaneous ignition when brought into contact with atmospheric air is well known; and as the components of which this is made up exist in abundance in the human body, it is not outstretching the bounds of probability to suppose that it is sometimes generated in the living system.

Another case is cited by Marsh which has some bearing on this subject and may be mentioned here. It was that of a woman having an enormous ulcerating cancer of the breast, the luminosity emanating from which could be distinctly perceived at a distance of twenty feet.

Crocker says there is strong reason for believing that the phos-

phorescence is due to bacilli, Beyerinck having found no less than six species of photobacteria, chiefly derived from fish, which will excite fermentation in sugar solutions in the presence of oxygen and peptone.

Hæmatidrosis.

The fact that such an affection as hæmatidrosis existed was never doubted until the early portion of this century, when a disbelief in the possibility of a true bloody sweat prevailed very generally. To Parrot, however, we are indebted for a rehabilitation of the term and a demonstration from carefully observed clinical data of the existence of such a condition. In a series of able papers, Parrot[1] collected a large number of cases, some of which are quite convincing. Many, however, I cannot entirely concede to be cases of true hæmatidrosis, and I would warn the student unfamiliar with more recent dermatological literature that each case is to be criticised upon its own merits and without regard to the conclusions which may be drawn from it by the talented author.

Parrot states that the affection is peculiar to nervous women, but there are, I am sure, many exceptions to this. However, in such cases it appears in the midst of undoubted symptoms of hysteria. These women have crises, spasms, various disorders of sensation, and many are chlorotic or anæmic.

In addition to these general symptoms, indices of a general perturbation of the nervous system, there are frequently premonitory phenomena, troubles of sensation or of vasomotor innervation in the region where the bloody sweat is about to appear. Of these local prodromes the most common is neuralgic pain with limited painful points, hyperæsthesia, sometimes slight œdematous tumefaction, or, on the other hand, various eruptions, such as erythema, sudamina, etc. It is upon these congestive patches and in the regions where the skin is most delicate that the bloody sweat at length appears, most frequently on the occasion of a violent emotion or of a neuralgic and spasmodic paroxysm.

The sanguineous fluid presents various aspects. At times the liquid, transparent, scarcely even rose color, forms nothing more than a thin coating on the surface. At other times it issues in minute drops of a rose color. Finally, in some cases it escapes in filiform jets from the pores of the skin. This red fluid is certainly blood. Parrot, who has examined it under the microscope, has recognized red and white corpuscles.

Hæmatidrosis occupies various areas of the surface at different times.

In some cases it is extremely limited, for instance to an area not larger than a coin; sometimes one or two fingers sweat blood. Parrot has observed these patches seated exactly upon the painful point in neuralgia. The areas of blood-sweating are situated at times on the face or scalp, or they may appear upon the extremities or upon the chest. In some cases the area of hæmatidrosis may be much more extensive and may, it is said, involve one-half of the body. I am not sure, however, that I can point to any indubitable case of such occurrence, at any rate, modern cases as reported describe only limited hæmatidrosis.

Hæmatidrosis is not a continuous affection, the bloody sweat appears only at intervals and proceeds by successive attacks, coinciding in general with paroxysms of pain. The pain comes on, the skin becomes red and swollen, then the blood flows. These attacks are rarely periodical; most frequently they are extremely irregular. They ordinarily accompany menstrual disorders or other manifestations of the neuropathic condition.

Hæmatidrosis is never alarming by its abundance. No fatal case so far as I am aware has ever been determined by this cause. In hysteria, hæmatidrosis does not seem to threaten life or even health in proportion to its abundance.

Such is hæmatidrosis as described in Parrot's papers, whose voluminousness, due to the careful detail of very numerous corroborative cases, has been excellently condensed by Bouveret, to whose work [1] I have been much indebted in the preparation of some parts of the present article. Parrot has proved the neuropathic nature of this affection by bringing to light the numerous affinities which connect hysteria and hæmatidrosis. Hæmatidrosis, according to this author, ought to be considered as a sort of hemorrhagic neurosis, the more so as it accompanies in many cases hemorrhages of the stomach, the uterus, and the bronchi, the neuropathic nature of which is beyond doubt. The bloody sweat of the woman attacked by hysteria is therefore nothing more than a manifestation of this neurosis, under whatever forms more or less dramatic it may appear.

Hæmatidrosis may occur in other cases than those of neurosis. Magnus Huss considers bloody sweat as one of the forms of hemorrhage which are possible in hæmophilia. Parrot reviews the case upon which Huss founds his opinion and comes to the conclusion that it was not a case of hæmophilia but one of neurotic hæmatidrosis.

Huss' patient was an unmarried woman, twenty-three years of age, of a family quite free from hæmophilia. She had never shown any tendency to excessive bleeding. She was, however, of a highly nervous temperament. When about fifteen she suffered from a nervous

attack followed by convulsions, the result of a violent altercation and beating about the head. After recovering from the convulsive attack hemorrhage from the scalp was observed. For eleven days subsequently the patient remained in a condition of mental and physical torpor, from which she recovered in part but remained in bed during two months. During this time hemorrhage from the scalp, the eyelids, the ear, and the mouth recurred at intervals of a day or two. The scalp indeed secreted blood constantly, although no wound could be perceived. At the end of two months the hemorrhages had ceased, but the condition of physical weakness continued. There was an area of hyperæsthesia on the scalp at a point where the hair had fallen out to some extent. A week or two later the patient was feeling quite well, when suddenly at night, without any appreciable cause and while she was asleep, an abundant exudation of blood from the scalp broke out, accompanied by hæmatemesis. After continuing for eight days the cranial hemorrhage ceased, but two months later, after violent emotion, the hemorrhage of the scalp again broke out accompanied by bleeding from the eyelids and the ears. Similar attacks continued to occur at intervals of about a fortnight but without apparent injury to the patient's health, and without any reference to menstruation, which continued with regularity.

The patient continued under observation in hospital during many months, showing typical attacks of severe hysteria from time to time accompanied by hemorrhages as described above. The bloody exudation from the scalp showed itself on either side of the coronal suture, lasting from a few hours to several days. The skin was not swollen, only warm and somewhat hyperæsthetic.

Ordinarily the exudation took place only from the scalp, but at times the blood exuded from around the eyelashes, more rarely about the hairs of the left axilla, the nipple, and once about the hairs of the pubes. Other hemorrhages, from the ear, stomach, and intestine, were observed from time to time, during the course of which ecchymoses and sugillations irregular in shape and from 4 to 6 cm. in diameter occurred over the entire left side of the body and particularly about the left shoulder. These ecchymoses were never observed on the right side of the body.

A curious fact developed in the course of the patient's stay in the hospital. She became the object of so much attention and sympathy on the part of visitors that she got into the habit of provoking the attacks by getting into altercations and factitious states of excitement. The patient was finally lost sight of while still under the same condition and subject to attacks of hysteria and bloody exudation.

Certainly this case could not be called one of hæmophilia, and it

only serves as an illustration of Parrot's view of the close connection of neurosis and hæmatidrosis. But other observers have noted hæmatidrosis under other conditions. Hebra reports the case of a young man, strong and well nourished, who was attacked repeatedly by hemorrhage from the surface of the lower limbs. This generally occurred during the night, so that he first became aware that the bleeding had taken place by finding the sheets stained with spots of blood when he awoke. Hebra once saw blood flow from the uninjured back of the hand of this patient while sitting near him at table. The blood formed a jet which would correspond in size to the duct of a sweat gland. This jet had also a somewhat spiral form and rose about one inch above the surface of the skin.

The term hæmatidrosis should, Hebra thinks, be applied to those cases only in which all the cutaneous glands (but especially the sudoriparous) being in a state of exalted activity, should consequently pour out a large quantity of fluid containing blood mixed with their watery secretion. "No one, however;" says Hebra, "so far as I am aware, has ever seen such an affection as I am supposing. The complaint described by writers as hæmatidrosis has always been simply a hemorrhage from the skin."

In the hemorrhagic forms of infectious diseases, "is it possible," asks Bouveret, "that the blood can dilate the glomeruli and escape by the sudoriparous glands?" If such hemorrhages have been observed they certainly differ in many respects from neuropathic hemorrhage and should be placed in an especial class. The dominant factor in such cases is the alteration of the blood, perhaps of the vascular and glandular walls—above all, the asthenic, adynamic character of the hemorrhagic discharge. In these cases there is none of that sort of general and local erythism which is one of the most striking symptoms of neuropathic hæmatidrosis. Hemorrhages of this character have been observed during the plague, certain malignant fevers according to the older writers, and more recently in yellow fever. Guyon[14] has called attention to hæmatidrosis in yellow fever. This hemorrhage appears at the time when the patient's body is covered with an eruption analogous to miliaria.

Hart[15] has published a case where a young man was attacked with fever and prostration. Gradually the escape of blood from the mucous membranes, the stomach, the intestines, the bladder, and finally the skin set in. The entire body seemed to be covered with bloody sweat. The skin, however, showed no appreciable lesion. When wiped off it seemed merely rather more white than usual. The symptoms became more and more severe until the patient finally succumbed. After death the skin presented such a tone of pallor that

the cadaver looked like a marble statue. What makes it more likely that this hemorrhage was in fact through the sudoriparous glands was that the skin showed no sign of congestion.

In connection with neuropathic hæmatidrosis reference may be made to certain hemorrhages of the sudoriparous glands which make their appearance without any previous disturbance of the nervous system, but under the influence of some violent and accidental perturbation of this part. This variety may also occur in men. Parrot cites a number of examples, some from older authors. A criminal having heard the sentence of death pronounced upon him broke out into a general bloody sweat (Maldonatus). A woman seeing two men engaged in mortal combat was seized with such fright that she fell unconscious and blood issued from the pores of her skin.

Finally, hæmatidrosis may occur during an attack of severe visceral pain as in renal colic. It may be provoked by violent muscular contraction, as in the case of a young girl who after prolonged dancing sweated blood. Wilks has published a case of hæmatidrosis occurring during an attack of tetanus.

Parrot has shown that hæmatidrosis is most frequently a hemorrhage of nervous origin. It may be hoped that investigations on the innervation of the sudoriparous glands will in time enable us to explain the mechanism of the disease. There is no ground, however, to invoke the action of excito-sudoral filaments. As has been intimated, hæmatidrosis is not, properly speaking, an alteration of the secretion but rather an hemorrhage into the sweat gland. Parrot likens it to the other symptoms often occurring simultaneously with hæmatidrosis, such as hemorrhages into the stomach, uterus, etc., which are glandular hemorrhages.

The hemorrhage in hæmatidrosis is, therefore, in all probability the consequence of a profound disturbance of the vascular innervation of the gland coil. The tension of the blood suddenly becomes augmented, the vascular wall yields, and the blood escapes, sometimes, as has been said, with sufficient force to jet out from the glandular orifice to a perceptible height above the surface of the skin. This interpretation will be accepted more readily when the abundant vascular supply enveloping the gland coil is considered, and especially the peculiar conditions of the circulation in the glandular organs. More than any other local circulation the glandular circulation is under obedience to direct or reflex nervous influences. The dilator nerve of the vessels induces the accumulation of blood around the acini; the secretory nerve incites the glandular element to extract the elements of the secretion. These are the two phenomena of all secretion. Of these two phenomena, the first only is profoundly

disturbed in hæmatidrosis. There are many other forms of hemorrhage where there is unquestionable disturbance of the vasomotor innervation; such are hemorrhages in the pericranium, the pleura, and the synovials, which occur in hemiplegia. Vulpian remarks with great reason that a certain morbid local predisposition of the vasomotor apparatus most probably exists in the case of hæmatidrosis, because while hysteria is common, bloody sweat is a rare affection.

Whether the yielding of the vascular wall, of which Bouveret speaks, is really a fracture of continuity, or whether, as Schwimmer[16] thinks probable, the escape of blood is a diapedesis, is, I think, uncertain. The same problem confronts us in purpura, which I am inclined to think approaches in some of its varieties the affection we are discussing. In the latter affection, at least in some of its forms, there is probably a paralysis of the vasomotors. In both forms of disease neuralgic pains are encountered, so that it would seem that some irritation of the sensory nerve fibres comes simultaneously into play.

Before closing this subject, I may refer in illustration of the suggestion I have just made of a close connection between purpura and hæmatidrosis to a case reported by Lancereaux.[17] It concerned an hysterical woman affected with left hemianæsthesia who developed a well-marked purpuric eruption confined to the left side of the body.

Anidrosis.*

The term anidrosis is applied to the diminution and insufficiency of the sweat secretion. This marked condition is observed as a complication in many chronic affections of the skin, in chronic eczema and psoriasis, in xeroderma pigmentosum, in various chronic erythrodermata (pityriasis rubra, exfoliative dermatitis, etc.), in the senile condition, and above all in ichthyosis and xeroderma.

Aubert,[18] who has made a very careful study of the perspiration in connection with various diseases of the skin, has ascertained the following facts:

In *nævus pilosus* there is always hypersecretion, even when the neighboring integument scarcely secretes at all. This hypersecretion should correspond with the hypertrophy and hyperæmia of the glandular elements coexistent with the greater development of the hairs.

In *nævus vasculosus* the sudation is more active than in the surrounding skin, while in nævus pigmentosus the glands seem to act in exactly the same manner as that of the surrounding skin.

* Dysidrosis, which is sometimes described as a disease of the sweat glands, is in reality a general inflammatory process and does not involve these glands.

In *ephilis*, *vitiligo*, alopecia areata, and tattoo marks no difference between the affected and the healthy skin is perceptible.

In *ichthyosis* three different conditions have been observed. 1. Diminution to a marked degree in the number of sudoriparous glands, or at least of glands retaining and exercising their functions; 2. Irregularity in the disposition of the glands; this is perhaps more apparent than real, and is due to the fact that a great number of glands are suppressed; 3. Hypersecretion, probably of a supplementary character, in some regions less profoundly altered by the ichthyotic condition.

In the skin surrounding *ulcers* the sweat secretion is increased, and the same is the case in deep cutaneous hyperæmias. In *roseola*, *urticaria*, and sometimes in *prurigo* no change in the normal secretion was observed by Aubert.

Hebra, however, says that complete suppression of sweat secretion or marked diminution of the same is observed in patients suffering from prurigo, and as both ichthyosis and prurigo generally last throughout the lifetime of the patient, it may be asserted that in these two affections a complete and life-long condition of anidrosis exists in the majority of cases.

Contrary to the opinion of Hebra, Aubert has found in several cases of true prurigo that the sweat secretion is not entirely abrogated. The number of sweat glands is not normal, it is true, but even in the most seriously affected localities it is fully two-thirds of the normal number.

In *purpura*, Aubert found, in the single case examined, that while the purpuric spot itself showed no secretion of sweat, the neighboring healthy skin was normal in this respect. Vinay has found that in purpura the principal seat of hemorrhage was about the coil of the sweat gland. This would not only account for the suppression of the sudoral secretion, but, as we have seen under hæmatidrosis, the same fact makes possible a true hemorrhage through the sweat gland.

In *psoriasis*, almost complete anidrosis exists over the affected patches and when they are at the height of their development. As they fade, the sudoral secretion is again established, and it is a curious fact that a transitory local hyperidrosis is sometimes observed at these points.

In *erysipelas*, complete anidrosis exists, in *herpes*, there is a temporary arrest of secretion, and in *eczema* the same condition as in psoriasis. The other affections investigated by Aubert, particularly those of an inflammatory nature, showed a similar condition of temporary anidrosis.

STRUCTURAL AFFECTIONS.

The structural affections of the sweat glands are those connected with inflammatory processes and those derived from the invasion of new growths. Of these I shall describe, as coming within the scope of the present article, *miliaria*, *hydrocystoma*, and *hidrosadenitis*.

Miliaria.

This affection is characterized by an obstruction to the sweat secretion, with or without inflammation as a cause or consequence. The non-inflammatory form is called sudamen, or miliaria crystallina. The lesions are minute clear or pearly vesicles closely crowded together, but never confluent, occurring usually on the trunk, especially the neck, chest, and abdomen, though they may appear anywhere. They form rapidly, do not enlarge after the first few hours, and get well in a few days, unless fresh crops appear, which may keep up the eruption for weeks.

The lesions are simply the result of the sweat being unable to escape, owing probably to an accumulation of epithelium at the orifice of the duct, when the sweat function is in abeyance, as in fevers; then when the secretion is restored, especially by a "critical sweating," the fluid being unable to escape by a natural channel, is effused under the horny layer and forms a vesicle (Crocker). Robinson has made a careful and critical microscopic study of the lesions.

Miliaria vesiculosa, or *rubra*, says Crocker, has the same relation to sudamen (miliaria crystallina) as acne vulgaris has to comedo. Inflammation occurs in the gland as a consequence of retention of the sweat secretion, vesicles arise in great numbers upon the trunk, especially upon the back, but they also come upon the face and limbs. The lesions are acuminate in form, whitish or yellowish in color, and situated on a red, raised base (the miliaria rubra of authors). The vesicles run an acute course, drying up in a day or two, or may last some time, depending upon the persistence of the cause, usually hot weather or excessive clothing. This is the *strophulus* or *red gum* of older writers, and is very common among infants, especially in summer. There is a good deal of prickling as a general thing.

Miliaria papulosa is the affection formerly known as *lichen tropicus* or "prickly heat." It consists of minute red, acuminate, discrete papules closely crowded together, with vesicles or vesico-pustules interspersed. It comes out suddenly over large areas and is accompanied by excessive sweating and intolerable prickling and tingling.

It is said to differ from *miliaria vesiculosa* in that the inflammation produces the obstruction to the sweat secretion instead of *vice versa*, as in the former disease. It is essentially a tropical disease, though in a milder form often met with in our hot American summers.

Miliary fever, or "sweating sickness," is an epidemic febrile disease in which profuse sweating and miliaria are prominent symptoms. It was very fatal in the later middle ages, and an epidemic has been described as occurring in France as late as within the last few years.

Sudamen, or *miliaria crystallina*, occurs as a symptomatic eruption near the termination of fevers, such as typhus, typhoid, acute rheumatism, puerperal septicæmia, or in tuberculosis. It is a symptom of depressed vital power. The other two varieties are, as has been said, usually due to over-heating and the induction of excessive sweating. In the tropical form it is said that one attack predisposes to others. The disease may run on into eczema.

Treatment.

The treatment of miliaria includes removal of the cause when this is possible—that is, keeping the patient cool and lightly clothed. Cool baths and saline diuretics are usually to be recommended. Vinegar and water, dilute lead water, black wash, or some soothing and astringent lotion may be employed. Solution of sulphate of copper, ten grains to the ounce, may also be employed. The latter is a favorite remedy, I understand, in Cuba and the West Indies. Astringent powders as bismuth subnitrate, oxide of zinc, or kaolin are also useful. The following camphor powder—

℞ Pulv. camphoræ, ... 3 i.
Pulv. zinci oxidi,
Pulv. amyli, ... āā ʒ ss.
M.

will often relieve the prickling and burning. Ointments are out of place. In the severe forms of the tropical variety, I should think that tincture of belladonna in gtt. ij. doses, or sulphate of atropine in gr. $\frac{1}{200}$ doses, pushed to its physiological effect, might prove useful. I have never had an opportunity to try this treatment, as the milder local measures mentioned always suffice in our climate.

Hydrocystoma.

Hydrocystoma, or cysts of the sweat glands, is usually encountered on the face, and particularly in women about middle age. According to Robinson[9] women who perspire freely and who are

exposed to heat, as laundresses, are particularly liable to this affection.

Hydrocystoma is a disease of summer; during the winter it disappears entirely. In a case coming under Hallopeau's observation, in which the disease was confined to the nose, the eruption was more confluent at the menstrual period and seemed to be equally under the influence of high temperature and of violent emotions.

The eruption usually shows itself at the lower portion of the forehead about the periorbital region, the nose, the cheeks, and about the lips. It has never been met with in the inferior maxillary region, the neck, or over the rest of the body.

In Jamieson's case the eruption was limited to the right side of the face, which was the seat of abundant transpiration.

The lesions of hydrocystoma are sometimes discrete, sometimes grouped, but in general they are not found near together excepting when they occur in considerable numbers.

The lesions consist in tense vesicles, transparent, shining, obtuse, round or ovoid, and of a size varying from that of a pinhead to that of a pea. They are at first deeply seated, that is to say, their base is implanted in the derma, but on account of their dimensions they are more or less elevated above the surface of the integument. The smaller ones resemble grains of boiled sago, the larger are of a deep-blue color which is particularly marked about the periphery.

Robinson has not been able to recognize the presence of the orifice of a sweat duct in the centre of any of the vesicles.

The skin does not present the appearance of inflammation at any point. There are no subjective symptoms excepting a slight sensation of tension. The fluid in the vesicles is always transparent and never takes on a yellowish tint, the vesicle drying up without rupture at the end of a fortnight or several weeks, leaving a very slight pigmentation which gradually disappears. Sometimes the contents of the vesicle become milky white, causing it to resemble milium. The reaction of the fluid contents is always acid.

Histological examination of the lesions of hydrocystoma shows the horny and mucous layers of normal aspect. The papillary layer is likewise normal at first, but as the vesicles extend so as to begin to involve this stratum, a certain number of leucocytes are observed about the vessels. The same alteration is observed in the upper part of the corium.

In the lower part of the derma and in the subcutaneous tissue the following lesions are observed: The secretory portion of some of the sudoriparous gland presents a dilatation of its canal by accumulation of fluid at the same time that numerous molecular granules

exist in its interior. In the regions where there are vesicles the connection of these with the sudoriparous tubes can readily be perceived. The latter at one point are seen to penetrate the base of the vesicle, at another point to emerge from the apex of the same. The entire wall of each vesicle is coated with a layer of epithelium. It may thus be perceived that the vesicles are formed by the dilatation of the excretory duct of the sudoriparous glands at some point of their passage through the chorion, notably at its lower part.

Etiology.

As to the cause of this dilatation, that is a very difficult matter upon which to decide. It may be that the obstacle to the exit of the perspiratory fluid is seated in the excretory tube or in the connective tissue surrounding it.

Diagnosis.

As regards the diagnosis of hydrocystoma, this eruption bears some resemblance to sudamina, to dysidrosis, to eczema, and to adenoma of the sudoriparous glands. Sudamina are produced by the retention of sweat in the horny layer of the epidermis, the cells forming the wall of the sweat duct separating and permitting the sweat to infiltrate into this horny layer and to collect there. Sudamina are rarely seen upon the face. They are more superficially situated than the lesions of hydrocystoma and have a thinner wall. The nature of the contents of the vesicle is the same both in sudamen and in hydrocystoma; in both affections there is a retention of sweat. For this reason Robinson was at first inclined to make hydrocystoma a variety of sudamen. At present, however, he classifies the two affections separately, laying stress upon the fact that in the affection under consideration the proliferation of epithelial cells is sufficiently rapid and profuse to form a sharply limited wall to the cyst.

Hydrocystoma differs from eczema by the acid reaction of the contents of the vesicles in the former, the absence of inflammation, and the formation of crusts. The nature of the vesicular contents and the concomitant symptoms suffice to distinguish hydrocystoma from adenoma of the sudoriparous glands.

Jackson, Jamieson, Rosenthal, and Hallopeau have described hydrocystoma under the name of dysidrosis. The latter may be defined as an acute inflammatory affection characterized by the symmetrical development upon the palmar and plantar regions of groups of transparent vesicles profoundly situated, and which later become opaque and disappear in a few days by rupture or absorption.

Hidrosadenitis.

Hidrosadenitis, as described by Dubreuilh [*] is constituted of disseminated or isolated lesions. Even where these are very numerous in any one locality they are not grouped in patches except in rare instances and over limited areas.

The eruptive element shows itself as a minute nodule the size of a pin's head or grain of millet, hard, indolent, sharply defined, situated deep in the skin or even subcutaneously, scarcely causing an elevation of the overlying epidermis, which remains entirely unaltered. The presence of the lesion is hardly perceptible excepting to the touch, to which it gives the sensation of a grain of lead deeply embedded in the skin. This nodule grows in size very gradually and becoming adherent to the skin makes one mass with the latter. The skin then shows an elevated, red, inflamed papule deeply seated in the skin and which may attain the size of a pea. The lesion at this stage sometimes assumes a coppery tint, which causes it to resemble a syphiloderm so closely as to deceive the observer. Cases have thus been treated for syphilis.

When the lesion has attained its full development it is sometimes surmounted by a vesicle and sometimes goes on to suppuration. In the vesicular form, as observed by Bronson, the vesicle is not elevated, rather countersunk, and it frequently presents in its centre a minute crust raised by the underlying fluid. Dubreuilh has had occasion to observe under the microscope the beginning of this process. The crust occupies the sudoriparous orifice, and the congestive exacerbation continuing its evolution in the neighborhood leads consecutively to a fluid exudation in the epidermis, which raises up the crust with the horny layer of the epidermis. At the end of several days the vesicle may dry up and crust or a new suppurative process may follow.

When the lesion terminates in suppuration a small whitish point appears at the summit of the papule, which, when pricked, gives exit to a drop of pus. Pollitzer has observed the exit of a core like that of a boil in some of these cases. Pick has seen the entire nodule emptied out in the form of a soft mass of waxy consistence. When the pustules are small, covered with a thin epidermis and exposed to the air, they may dry up and crust over without breaking open, and a papule results with a brown adherent crust countersunk in the derma. No pus is found under the crust, but only a minute ulcer with excavated pits. If the lesion is larger, if the thickness of the epidermis or the protection of the clothing prevents desiccation, suppuration

takes place, the little abscess opens externally, and a crust forms from the desiccation of the pus which exudes. In some cases this is followed by desiccation, leaving a flat or sunken scar from a millimetre to a centimetre in diameter, according to the size of the precedent lesion. This cicatrix is at first red or pigmented but later becomes white.

The eruption may show itself in almost any part of the body, but the genitals have never been observed to be affected. Other parts, as the inguinal region, the popliteal space, the bend of the elbow, the abdomen, and the upper and middle portions of the back are rarely or slightly affected. The regions of predilection are certain portions of the face, the scalp, extending to the neighboring localities, as the anterior and lateral parts of the neck, the ears, and the inferior maxillary region, also the lumbar region and the extensor surfaces of the limbs. On the upper limbs the eruption predominates about the bend of the elbow, running up the posterior aspect of the arms and extending downwards on the extensor surface of the forearms, being especially marked upon the backs of the hands and fingers. The principal foci are generally observed upon the lower limbs, the thighs and the knees, and on the backs of the feet. It is sometimes observed upon the palms and soles. It has been supposed to occur also upon the buccal mucous membrane. The eruption of hidrosadenitis extends by the appearance of single new lesions. Sometimes a few appear at a time, or a number may develop in rapid succession at intervals. There is no general outbreak, however. It may be remarked that when the eruption is abundant the lesions develop more rapidly and suppurate more freely. In any case, however, a certain number of lesions become arrested in their development, become absorbed, and disappear without suppuration. There are no general symptoms which can be said to belong properly to the eruption. Lassitude, anæmia, and digestive disturbances are sometimes met with, however.

Hidrosadenitis is an affection of slow development and long duration. Most cases persist for six months to a year.

The causes leading to the eruption are not known. The heat of summer causes an aggravation of the symptoms, but the general conditions just mentioned cannot positively be asserted to be of etiological moment.

So far as is known, hidrosadenitis is a purely inflammatory disease of the sweat glands. No microbes have been ascertained to be involved in the process, although the question of its microbic origin cannot be said to have been settled. The hair follicles in the neighborhood of the lesions are not usually involved. Barthélemy has

observed inflammatory lesions of the hair follicles and sebaceous glands, but such inflammation appears to be secondary.

The disease is not, properly speaking, a folliculitis or folliclitis as Brocq has called it, nor an acne or acnitis since the process does not involve the sebaceous glands or the hair follicles. The name hidrosadenitis therefore seems most appropriate.

Diagnosis.

The affection with which hidrosadenitis is most apt to be confounded is *acne varioliformis* (Hebra), *acne pilaris* (Bazin), and some cases of hidrosadenitis have been published under these titles. The *acne necrotica* of Boeck is seated upon the face and trunk and begins as a minute papule with a hair issuing from its centre. This papule grows little by little, takes on an œdematous appearance, and shows a minute hemorrhagic point of a violaceous color which is highly characteristic. When it has acquired a certain dimension it becomes surmounted by a soft adherent crust which extends and covers the entire lesion. This crust covers a deep ulcer and only falls off when cicatrization is complete. It is derived, not from an exudation but from the necrosed derma; there is no suppuration.

Acne pilaris of Bazin, or *acne varioliformis*, is situated on the forehead just at the border of the scalp, in the beard, and in the fold of the ala nasi. The lesion, characterized by a yellow crust, usually contains a hair at its centre, does not suppurate, and terminates by a cicatrix; in addition, it is readily cured. Neither acne necrotica nor acne varioliformis begins by a deep intra- or subdermic nodule. The various forms of *folliculitis* are distinguished by the central hair and never occur on the palms or soles. The eruption known as hydroa vacciniformis (Bazin), summer eruption or *summer prurigo* (Hutchinson), is a disease of summer time only, is caused by light and heat, and is highly pruritic. The case published by Lukasiewicz[11] under the name of *folliculitis exulcerans* is likewise to be distinguished from the affection under consideration. In this case the eruption forms groups with a centrifugal tendency. The lesions are not suppurative but ulcerative, and form deep ulcers with a granular bleeding basis and a tendency to spread. Moreover, periostitis and violent pain in the bones and in the articulations are experienced. The lesions can only be cured by curetting. In Dubreuilh's opinion, Lukasiewicz's disease is a granuloma which begins in the skin as a collection of embryonal cells with epithelioid and giant cells, and which reaches the surface and ulcerates but does not suppurate. The glands are only involved by subsequent invasion. Perry[12] gives a representation of hidrosadenitis.

Under the name of *hidrosadénite phlegmoneuse et abcès sudoripare*, Verneuil[11] describes an affection of the sweat glands which also has been called sweat furuncle, and which occurs chiefly in the axilla, groin, around the nipple and anus, but also on the scrotum and perineum, the labia majora, the face, the thighs, the external auditory meatus, the palms, in fact at times on almost all parts of the surface excepting the soles. The disease often accompanies pruritic affections of the skin, particularly those of a parasitic nature, and is probably due to implantation of germs in scratching. Want of cleanliness, rough handling and friction, irritant applications, medicinal or other, the repeated introduction of foreign bodies into the external auditory meatus, etc., are among the exciting causes. As predisposing causes may be mentioned profuse sweating in the axillæ, groins, genitals, etc., during hot weather, violent exercise, pressure as of a bandage or splint, fissures occurring about the nipples in nursing, purulent discharges from the female genital organs, hemorrhoids, constipation, and, as has been mentioned above, various parasitic affections of the skin.

Symptoms.

The clinical appearances presented by phlegmonous hydrosadenitis differ somewhat according to the locality affected. In the axillæ the affection is commonly observed during the summer, and in young persons more or less careless in their habits, when the axillæ are constantly bathed in acrid and malodorous perspiration and provided with an abundant growth of hair.

The phlegmonous lesions may appear upon one or both sides simultaneously or successively. They may be single or multiple, sometimes confluent. They vary in size from that of a pea to that of a pigeon's egg. When fully developed they are, on an average, about the size of a cherry. They usually appear at the summit of the axilla, rarely at its circumference. When there are several they are usually seen at various stages of development. When discrete, the lesions present the typical appearance of an abscess; globular in form, with a hemispherical furuncular outline rising from the skin, and freely movable between the fingers and over the subjacent structures. At first firm and of an indolent appearance, without any change in the color of the skin they become at a later period red and inflamed, and soften at first at the summit and afterwards through the entire mass. When the disease centre is superficial or when there are numerous closely packed lesions the appearance presented is different. In the first case the skin becomes involved at an early period, it reddens, indurates in the form of more or less regular discoid plates movable

under the skin and slightly elevated above the surrounding surface. Later the plaque seems to become segmented, several prominent points appear upon its surface, separated by fissures of greater or less depth and which may show isolated points of fluctuation when the skin covering them becomes thin. When the phlegmons, at first separated, become packed together by their several growths, they become deformed by mutual pressure and display irregularly shaped prominences separated by fissures dependent upon the folds of the skin.

The last-described variety of phlegmonous hidrosadenitis is that usually observed upon the surface of the skin, generally when the integument is thicker and is raised up with more difficulty. The skin here is inflamed almost from the first, while redness, tenderness to the touch, and pain in movement are also perceived at an early period. The globular phlegmon, on the other hand, remains latent for some days and develops in the loose subcutaneous tissues, showing local reaction only when the skin itself becomes distended and ready for perforation. This form of hidrosadenitis may become the point of departure for sudoriparous adenoma.

Phlegmonous hidrosadenitis of the margin of the anus was formerly called by Velpeau "hemorrhoidal abscess." It does not, however, occur in the hemorrhoidal tumors themselves but in the tissues around the margin of the anus to the distance of about an inch. The tuberiform abscess, as Verneuil has called it, sometimes forms in the radiating folds, sometimes in the smooth margin around the anus, and may be single or multiple to the number of four or five. Usually only one occurs at a time, but relapses are common. The anal abscess may become transformed into a perineal abscess. Verneuil [1] describes a case of the kind. Fistulous tracts not unfrequently form, but these never communicate with the intestine, a point of importance in connection with the distinction which should be made between this affection and the ordinary ischio-rectal abscess.

Hidrosadenitis of the anal region manifests itself first in the form of anal pruritus. The patient scratches himself during sleep, giving rise to fissures, excoriations, and crusts. After a time, on washing himself or in some other accidental manner, the patient perceives a small subcutaneous irritation the size of a cherry stone, hard, sharply circumscribed, mobile under the skin, and not markedly adherent to the latter. There is no spontaneous pain although the tumor is sensitive to the touch, and, sometimes at the moment of defecation gives rise to a slight tenesmus. For three or four days the process remains in this stage, but the induration increases and elevates the skin, which becomes adherent; the surrounding cellular tissue becomes involved in the phlegmonous process. The tumor, up to this time

globular, becomes changed to an irregular shape according to the region invaded. It becomes flattened by pressure of the buttocks, and elongated in the direction of the folds of the anus and extends in an oval form towards the rim of the scrotum and the perineum.

The growth continues, the skin becomes thinned over the centre of the tumor, and of a livid red color, exfoliates, and shows fluctuation in the neighborhood of the point where the induration originally appeared. At this period considerable pain is experienced; walking becomes difficult, and sitting down as well as defecation gives rise to extreme discomfort, which, however, is relieved upon lying down. The pain is, however, not severe and is superficial and evidently due to the secondary involvement of the skin. Left to itself the tumor breaks down and discharges even before the entire mass becomes fluctuating. Sometimes this process is less painful than even the slight puncture necessary to evacuate its contents.

Phlegmonous hidrosadenitis of the areola of the nipple and of the skin generally scarcely merits a particular description. Verneuil gives a very minute study of all the various forms of the disease, and the student may be referred to his voluminous paper" for further details.

Diagnosis.

Perhaps the most important point which remains to be considered is that of diagnosis.

As regards abscess of the external auditory meatus, this differs from hidrosadenitis as met with elsewhere, inasmuch as there is no globular or hemispheric mass such as is observed elsewhere. It is impossible to find any fluctuating point where the bistoury can be used. The entire canal is red and tumefied. There is no superficial, acuminate projection as in furuncle.

In other localities, as in the ear, furuncle is the only affection with which phlegmonous hidrosadenitis is apt to be confounded, and, in fact, the affection under consideration is almost always mistaken for furuncle. The distinction can be made, however, without difficulty.

Furuncle always begins at the surface and only later attains the subcutaneous cellular tissue, because it is seated in a pilous or sebaceous follicle and never in the deeper areolar cavities of the derma. At whatever period it may be examined it is always found surmounted at its centre by a conical elevation often perforated by a hair. When an opening is made at this point, only a minute quantity of pus exudes, and no relief from the pain is gained until after the relatively late discharge of the core, leaving behind it a gaping cavity in the centre of the induration.

Phlegmonous hidrosadenitis, on the other hand, always begins beneath the skin and only invades the skin subsequently. No conical elevation surmounts the lesion, and no discharge takes place until the lesion is opened by artificial means, when the affection rapidly heals up.

Sometimes, during the first days of the process, phlegmonous hidrosadenitis may resemble erythema nodosum or syphilitic gumma, but the course followed by these affections is so different from the disease under consideration that a short period of observation will settle the question.

Treatment.

The treatment of phlegmonous hidrosadenitis consists in cleanliness and antiseptic precautions, with appropriate means for the prevention of excessive sweating. When ripe, the abscess is to be opened, whereupon a speedy cure results.

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DISEASES OF THE HAIR AND NAILS.

BY

DOUGLASS W. MONTGOMERY,

SAN FRANCISCO.

DISEASES OF THE HAIR AND NAILS.

THE HAIR.

THE hairy covering in man is the same, in its general features, as that of the other mammalia. Its distribution, however, is peculiar. On the scalp, the genitals, and axillæ it is well developed, while on the general surface its growth is so insignificant as almost to constitute hairlessness. Even on the comparatively hairless general surface, however, the downy hair has undoubtedly some effect in conserving heat, and the skin is made by it to look much softer than if it were absolutely bald. It is the successful imitation by painters of this soft look, caused by the fine hair and the cross lines of the skin, that constitutes much of their success in representing the integument.

The hair is a thread-like body formed of keratinized epithelial cells. These cells are the same in their nature as the hard stratified epithelial cells covering the external surface of the body. In fact the cells lining the pocket-like depression in the skin, out of which the hair grows, are a direct continuation of those on the surface of the body, and the little projection, the hair papilla, at the bottom of this pocket is a sunken papilla of the papillary layer of the skin. The base of the hair fits down over the papilla, drawing nutriment from it, and also from the epithelial cells that line the inner surface of the hair follicle, so that a hair may even lose its attachment to the papilla and still continue to grow from these root sheath cells. In this case it constitutes what is called a bed-hair, and after a time drops out to be replaced by a hair growing directly from the papilla again.

Hygiene of the Hair and Scalp.

The hair has a great tendency to accumulate dirt. It catches the dust flying in the air, and also retains the secretion of the fat glands, the desquamated epithelium of the scalp, and the products of perspiration. This dirt can be removed either by using a comb, especially a fine-toothed comb, or a brush, or by washing. For women having a heavy head of hair the fine-toothed comb is ineffective, because it

can with difficulty be made to take hold, and because, when it does penetrate, it pulls so severely as to break the hairs. Women should therefore use a comb having large smooth teeth. The bristles of the brush should be tolerably stiff, and the tufts of bristles should be well set apart. The brush and comb ought to be kept perfectly clean. They can be cleaned in a few moments by shaking them in a basin of hot water in which some pearline is dissolved. In order to dry a brush quickly, set it on a sunny window sill bristles down, so that the water drains off, instead of soaking into the back of the brush.

The number of times the hair should be washed will depend upon the production and accumulation of epithelial detritus and fat, called dandruff, and upon the amount of dust caught. The washing should not be done every day, or even every few days, but every three or four weeks, as the removal of the protective oil leaves the hair dry and brittle, and, furthermore, undue frequency of washing is very irksome to women with abundant hair, on account of the length of time necessary for drying.

There is a great number of substances used for cleansing the hair and scalp, such as yolk of egg beaten up with water, borax, quillaia bark, and many different kinds of soap. The most manageable, and the most thorough for ordinary use, is the solution of soft soap in alcohol, called the tincture or the spirit of green soap. The hair can be parted, and the soap poured along the part, and then well rubbed into the scalp, being washed out with a douche of hot water. Hair rinsed in hot water dries in a much shorter time than when rinsed in cold water, which is a consideration with women, the operation of drying long hair being tedious. It should be well wrung out, and squeezed in hot towels, and the person should sit in the sun or by a stove till the hair is thoroughly dry.

When the hair is not washed too frequently, it is rarely necessary to use any oil, as the natural oil of the hair quickly replaces that lost. When the hair is normal, it itself, together with the fat and sweat glands, furnishes enough oil to keep it glossy and smooth. Sometimes not enough oil is furnished, and the hair begins to look dry and dull, whereupon it soon commences to fall out. This shedding of hair can be anticipated by noticing the dulness, and supplying a little of the needed oil. Olive oil is a good clean oil that does not leave the hair sticky. An excellent remedy in such an event is a lotion made of the oleates of the group of the cinchonidines dissolved in water as recommended by H. L. Wagner. Like quinine preparations it should not be used indefinitely, as it causes, after a time, temporary brittleness of the hair.

Twin or Triplet Hairs.

Usually only one hair grows in a follicle, but twin and triplet hairs have occasionally been observed. In 1883 Flemming[1] reported an instance of three hairs growing in a common hair sac, and in 1893 Sebastiano Giovannini[2] described a case in which two hairs occupied one follicle. Giovannini is of the opinion that this condition does not always remain simply an anatomical curiosity, but that the irregularly formed hairs may cause a sycosis, and in support of this view has reported a case.[3] In this instance the hairs that seemed to cause the folliculitis were short, irregular, thick, and split, and there were two medullæ in each hair. It could not be proven that the hairs causing the difficulty were twins, because the patient refused to allow the extirpation of a piece of the affected skin for histological examination.

These cases must be diagnosed from those of fragilitas crinium, where the splitting takes place in the follicle, such as reported by Louis A. Duhring.[4] As fragilitas crinium and multiple hairs may both cause folliculitis, and may occur on the bearded face, it would be well to bear them in mind in any obscure case of disseminated sycosis.

The treatment for multiple hairs would be the obliteration of the follicle by electrolysis.

Hypotrichosis Congenita.

Synonyms.—Atrichia congenita, congenital baldness, oligotrichia congenita, depilatio, or alopecia congenita.

Bonnet[5] objects to the terms depilatio and alopecia congenita, because depilatio and alopecia are usually employed to indicate the fall of hair already grown, and not a lack of hair from the beginning. Baldness from an error in development is quite different from a loss through accident or disease of fully grown hair, and it is not conducive to clearness to employ the same terms for such widely differing conditions. Bonnet therefore suggests designating any lack of hair through error of development, hypotrichosis; normally developed hair he would call eutrichosis; and an excess of development, hypertrichosis. By the addition of a characterizing adjective to the above terms, any particular case may then be more clearly differentiated.

The first indications of the hair in the fœtus appear toward the end of the third month, and consist of insignificant looking prominences on the integument. Microscopical sections of these prominences show them to be composed of a multiplication and heaping up

of the epidermal cells, and also show that this thickening of the epidermis extends inwards, diving down into the cutis, as well as outwards, forming the above-mentioned prominences. The protuberances on the surface soon disappear, leaving the skin level, but the downward growth of the epidermis continues, forming peg-like processes of epidermal cells in the connective tissue. Little by little a differentiation occurs, that ends in the formation of the hair sac and its contents, the root sheaths and the central hair. The fœtus then gets a complete and even covering of fine wool or lanugo hair, which afterwards differentiates, giving place on some parts of the body to stouter hairs, and in other regions retrograding so as to leave the surface almost bald. This development and differentiation continues long after birth, not steadily, but at stated intervals, at puberty, at the approach of manhood, and at the age of about forty-five years. It is therefore clear that any failure in development, from the first indications of the hair at the end of the third month up to the acme at the age of forty-five, may be characterized by the name hypotrichosis.

Hypotrichosis Congenita Universalis.

The hair, teeth, and nails are all derived from the epithelial covering of the body, and the relationship is so close that abnormalities in the development of the hair are apt to be accompanied by defects in the teeth and nails. This is so remarkable a feature that Bonnet[4] has classified the cases of hypotrichosis congenita into:

I. Congenital hypotrichosis associated with deficiencies, or irregularities in the formation of the teeth or nails.

II. Congenital hypotrichosis without defects of either the teeth or the nails.

III. The third and most frequent form of congenital baldness consists simply in tardiness of development of the hairs, and lateness in pushing their way through the epidermis.

Ecker's family of cases reported by Waldeyer shows conclusively that hypotrichosis congenita may be hereditary, for in one instance in this family the incomplete development of the hair was traced to the third generation.

There has never yet been reported a fully investigated case where all indications of at least an embryonic hair follicle have been absent. In the most extreme examples of atrichia, those reported by Jones and Aitkins[5] and Schede,[7] indications of hair follicles were found on microscopical examination. In the case that Schede examined, tubes were seen with epithelium resembling that of the external root sheath. In many places this epithelium had formed micro-

scopical atheromata, thus giving an indication of the origin of these peculiar tumors.

Bonnet[1] has described an excellent case of hypotrichosis in a kid, where the affection was due to tardiness in the development of the hair, and to a keratosis also of the epidermis. The hard epidermal cells formed horny plugs that blocked the mouths of the hair follicles and caused retention of the soft, delicate hairs.

The cases that have been grouped together under the designation of monilethrix are also instances of hypotrichosis accompanied by keratosis pilaris; this keratosis may form, as in Luce's case, horny plugs, which prevent the exit of the hair and cause it to twist up on itself and form retention cysts, each cyst occupied by a hair.

Another curious outcome of the closer study of hypotrichosis is to relegate to it most of the cases where there seemed to be a hypertrichosis or hirsuties. All those cases where the body is covered with long delicate, silky hairs, poor in pigment, are instances of the persistence of the fœtal lanugo or wool hair, and Bonnet suggests calling such cases pseudohypertrichosis lanuginosa, to distinguish them from true hypertrichosis. Most of the cases of pseudohypertrichosis lanuginosa show defective teeth, with other less conspicuous congenital deformities. The patients have also been constitutionally delicate, and have matured late.

Hypotrichosis Congenita Circumscripta.

Two cases of congenital circumscribed baldness, also called atrichia localis, have been described by Michelsen (Ziemssen's "Hautkrankheiten") and one by Unna (Orth's "Pathologische Anatomie"). In one case the bald spot was in the "eddy" on the top of the head; in the other two it was above the right ear. In two of the cases the bald patches enlarged with the growth of the child, and became covered with fine downy hair.

Hypertrichosis.

Synonyms: Polytrichia; trichauxis; hypertrophy of the hair; hirsuties.

There are two congenital affections accompanied by localized hypertrichosis, nævus pilosus, and spina bifida occulta. In nævus pilosus there are a few long hairs springing from a deeply pigmented skin, and in spina bifida occulta there is a tuft of long hair on the skin covering the defect in the vertebral column.

As indicated in the section on hypotrichosis, most of the cases that

have been looked upon as universal hypertrophy of the hair are really instances of persistence and growth of the fœtal lanugo hair, and therefore constitute a developmental defect, and not a hypertrophy. There are, however, undoubtedly cases where the secondary hair is abnormally long and abundant, and this hirsuties may involve the entire hair of the body, or it may be simply a luxuriant growth of the hair of the head, beard, etc. The increased growth of the hair of the face that may occur in women as well as in men at the age of about forty-five years is commonly attributed in women, along with every other ailment they have at this time, to the climacteric.

Frequently in scrofulous children one sees a growth of fine, silky, poorly pigmented hair down along the sides of the face in front of the ears. As Professor Horner, of Zurich, who first drew my attention to this symptom, said, "They all wear a beard." It is a symptom that has not received much attention, but is perhaps a persistence of the lanugo hair of the fœtus, and may indicate a congenital defect, or it may be another expression of the luxuriant growth of hair sometimes seen in consumptives.

In no case of hirsuties is there a new formation and increase in the number of hair follicles after birth; it is simply hypertrophy of the hairs already present. In acromegaly, along with the giant growth of the face and extremities, there is also an increased growth of the hair.*

Long-continued irritation will cause increased growth of hair, probably from the greater supply of blood to an irritated part. Irritating ointments, employed for acne, have been blamed for increasing the growth of hair on the face.

Treatment.

There may be hypertrichosis of any hair-bearing portion of the integument, but we are seldom called upon to treat it except when it occurs on the face, neck, bust, or arms in women.

The increased development of the hair on the face in women may be the cause of most acute mental distress. And the hypertrichosis need not be well marked in order to do this, for a faint shadow on the upper lip may be as annoying to some women as a fairly well marked mustache to others. Many ways have been taken to be rid of the disagreeable deformity. Some pull out the offending hairs, others shave them off, while others burn off the hairs in an alcohol flame, or use one of the depilatories. All these means are more or less irritating to the skin, and cause an increased determination of blood, and therefore an increased growth of hair.

Shaving is the least objectionable of them, and may be recom-

mended when the number of the hairs is too great to be removed permanently by electrolysis. Crocker recommends the use of a safety razor that is so constructed that, no matter how awkwardly it is manipulated, the woman cannot cut herself unless she tries.

The depilatories only destroy the hair shaft. They destroy the shaft well down into the hair follicle, but none of them destroys the hair papilla, and they therefore constitute only a closer kind of shaving, but, as they cause more irritation than shaving, their ultimate effects are worse. Duhring recommends the following:

℞ Barium sulphide, ... ʒ ij.
Oxide of zinc,
Powdered starch, ... āā ʒ iij.
M. Sig. Make into a thin paste with water and apply on the skin for ten or fifteen minutes, then clean off with a blunt knife, wash, and apply a soothing powder,

Moriz Kaposi' recommends a depilatory used for ages by the Jews. It consists of orpiment (sulphide of arsenic) and unslaked lime, which are made into a paste by the addition of water, and then heated. Quite a thick layer of the mixture is spread on the skin with a spatula and allowed to remain about ten minutes. It is then scraped off, and the hair comes with it. The surface is afterwards washed with lukewarm water, and a powder is dusted on.

Epilation by Electrolysis.

Electrolysis is the only means of definitely destroying hairs, but it has many drawbacks. It is wearisome both to the patient and to the operator. Each hair has to be treated individually, and some hairs have to be cauterized a number of times before they are finally destroyed. It is fairly painful to every one and very painful to some persons, and, if the fee be sufficiently high to remunerate for time and energy, it is expensive. Then again, the hairs in some regions are much more difficult to remove than in others; for example, those in the thin skin under the chin and on the front of the neck, which have a curved root, that makes it next to impossible to catheterize the follicle with the needle.

The instruments used in epilation are a galvanic battery, a needle holder, and a needle. The needle holder ought to be about three inches in length, and stout enough to be easily grasped in the fingers like a pen. The needle can be what jewellers call "steel broach," which is a piece of flexible steel tapering down to a dull point. The sizes recommended by Jackson, designated as 5 and 7, will be found serviceable. A needle made of iridium and platinum has been suggested by Hardaway and by Brocq, and was used by Giovannini in

his experiments on epilation.[18] The needle should be attached to the negative pole, while a sponge or cotton-covered electrode saturated with warm salt water is attached to the positive pole, and held by the patient with directions to complete the circuit by pressing the sponge into the palm of the other hand, when the needle has been inserted into the hair follicle.

The needle must be inserted along the side of the hair, following as accurately as possible the supposed direction of the follicle, and penetrating deep enough to reach its bottom, about three-sixteenths of an inch (5 mm.).

When the needle is satisfactorily inserted, the circuit is completed by the patient. The current should be strong enough (from 1 to 1.5 milliampères) to cause little bubbles of gas to appear around the needle at its point of insertion, and it ought to be allowed to act for about thirty seconds. By that time the hair is usually so loose that it will almost fall out, and it can easily be removed with its succulent root sheath, and then the needle can be again introduced to burn out the hole more thoroughly than can be done while the hair is *in situ*.

Very little can be done to mitigate the painfulness of this operation. Cocaine is out of the question, because frequent repetition might form the cocaine habit. The injection of water has been recommended for local anæsthesia and might be tried in very sensitive subjects, or the anæsthetic effect of cold may be obtained by laying a thin rubber bag, filled with crushed ice and salt, against the skin for a few moments.

Before removing the needle the patient should break the circuit by withdrawing the electrode from the palm of the hand. By closing the circuit after the insertion of the needle, and breaking it before the needle is removed from the hair follicle, the operation is made much less painful.

The histological changes in the tissues caused by electrolysis have been studied lately by Sebastian Giovannini.[19] He finds that no matter how careful one may be, the needle in about fifty per cent. of the introductions will pierce the wall of the hair sac, and get out into the surrounding tissue instead of following along down beside the hair to the papilla; but nevertheless, in the majority of cases, the changes wrought in the epithelial cells of the hair matrix and in the papilla are so profound that the epilation is successful.

The electrolytic action extends to the surrounding tissues, especially the tissues formed of soft epithelial cells. The sebaceous and the sweat glands suffer, and even the smaller neighboring hairs may be destroyed.

The electrolysis sets up a slight inflammation that lasts for several

days. On the sixteenth day after the operation all the necrosed tissue has been cast off. Some cornified epithelial cells, parts of the dead hair, may be found in the tissues even up to the fifty-eighth day.

On the third day the growth of new connective tissue begins, that ends in the formation of a cicatrix, which, when the electrolysis has been successful, completely obliterates the hair follicle and occupies its site. G. T. Jackson has seen hyperpigmentation result from electrolysis, but it must be an extremely rare sequel.

Brocq says that he has seen keloidal nodosites form; they were about the size of a large pin's head, scarcely visible, but quite perceptible to touch.

It is inadvisable to encourage patients to commence the treatment at all, unless there are only a few large hairs in a convenient locality. It is best to accentuate the pain and the tediousness of the treatment, so that if they commence they will be content to keep it up for a long time, or expect no results. It must also not be forgotten that one or two hairs often cause as much mental worry as a dozen, and until all the hairs are removed, the patient will persist in telling you there is no improvement. It is not wise to attempt the removal of a mustache composed of many long downy hairs.

In a case where there was a tuft of long hair on one side of the chin, I removed the skin and sutured with carbolized horsehair. The scar was linear and hidden under the jaw, and the result was eminently satisfactory.

Atrophy of the Hair.

Atrophy of the hair may assume many forms:

1. It may fall out completely or partially, constituting the different varieties of alopecia.

2. It may become porous, thereby containing more air, and it may lose its pigment. These changes include the various forms of canities.

3. It may become dry and lustreless, and split and break. This when extreme is called fragilitas crinium.

Alopecia.

Derivation.—Alopecia is from ἀλωπεκία, derived from ἀλώπηξ, gen. ἀλώπεκος, a fox, because foxes were supposed to be particularly afflicted with patches of baldness.

Definition.—The term alopecia is a general one, including all cases of loss of hair from whatever cause. It must be understood to mean,

however, the fall of hair already grown, and not congenital lack of hair, which is a totally different thing, and is called hypotrichosis congenita.

Synonyms.—The term alopecia is sometimes restricted to the act of losing the hair, to the time when the hair is actually falling, while calvities, or, more frequently in classical Latin, calvitium is applied to the fully completed state of baldness.

Ophiasis, from ὀφίασις, which is derived from ὄφις, a serpent, is an almost obsolete term applied to serpentine tracts of baldness of the head, or to a bald strip from ear to ear across the top of the head.

Traumatic Alopecia.

The most frequent instances of traumatic alopecia are those in which the hair is worn away from the occiput in children suffering from hydrocephalus, and is due to the constant rolling of the head on the pillow. In a lesser degree it happens to all children who are confined to bed for a long time, as in hip-joint disease. There is also said to be a traumatic alopecia of the crown of the head in women, from incessant injuries from hairpins and combs.

In erythematous eczema of the face the itching in the superciliary region is often intense, and I have twice within a short time seen the eyebrows worn down short with the rude rubbing.

There is a peculiar form of traumatic alopecia called trichotillomania.

Trichotillomania.

Derivation.—θρίξ, gen. τριχός, the hair, τίλλω, to pluck out, and μανία, madness.

Synonym.—The trichotillomania of Hallopeau is the trichomania of Besnier.

Definition.—Trichotillomania is a condition characterized by an intense itchiness of the hairy parts of the body and an insane desire not alone to scratch, but also to pull out and break off the hairs, causing an artificial alopecia. The itching is intense, and the patient, instead of simply scratching to relieve himself, tears the hair out in bunches. It may occur on any part of the hairy surface, or on all parts. The skin as well as the hairs is perfectly sound, and the patient may enjoy excellent health. Fournier advises a search for the stigmata of hysteria in all these cases; for instance, he found analgesia of the skin of the forearms in the patient shown by Hallopeau before the Society of Dermatology and Syphilography,[11] and the condition appears undoubtedly to be a symptom of either hysteria or

insanity, and not an independent disease. Besnier compares it with trichophagia and onychophagia.

The *diagnosis* of this condition is easy, because the affection is so unique. In ordinary pruritus the patient never pulls out the hair of the affected skin to relieve himself—in fact, one is at a loss to understand how such a procedure can ameliorate an itching sensation. In prurigo there are crusts and characteristic papules, neither of which are present in the affection under consideration.

Senile and Premature Alopecia.

According to Pincus, the life of a hair ranges from two to six years, after which it falls, to be replaced by a new one. In this way about fifty or sixty hairs are shed normally each day. In old age, and in some diseased conditions, the number of hairs shed is largely increased, and the production is diminished. This diminution may not alone be in number, but also in the size of the individual hairs. The affected hairs become more delicate and thinner than their antecedents till nothing is left but an epithelial plug, and even this disappears with the final destruction of the hair follicle. This so-called senile baldness is so frequent about fifty years of age that it has long been looked upon as a physiological process, as one of the advance guard of the symptoms of senility. It appears strange, however, that it should so frequently come on at a time (forty or fifty years of age) when a man is in the enjoyment of the most vigorous health, and when the hair of the rest of the body, the beard for example, grows more luxuriantly than ever. A good deal of light has been thrown on this subject during the past few years by Brocq, Tänzer, Unna, and others, who have found a number of diseases in which alopecia is the most marked symptom, and these alopecias are frequently accompanied by destruction of the hair follicles and consequent permanent baldness. The tendency now is to ascribe to disease a vast number, if not the majority, of the alopecias of youth and of middle age.

In senile baldness the hair is shed freely, and enough new hairs do not grow to make up the loss, and the new hairs frequently become more and more slender and delicate. As a consequence the hair becomes less efficient as a covering, allowing the white scalp to be seen through the thinned thatch. This process often begins at the whorl at the posterior part of the upper aspect of the head. Viewed from behind, the white scalp shining through the thinned hair looks like the moon as seen through ever-thinning clouds. Or it may commence anteriorly by driving a baylike indentation back

from each side of the forehead, forming what is called Andrew Jacksons. These bays may become connected by a bald band running across the top of the head, leaving a tuft or forelock above the forehead, suggestive of the representations of old Father Time.

When an uncomplicated baldness of this character occurs before forty years of age it is called premature, after forty, senile.

Premature alopecia seems to be hereditary in some cases. It is also commonly thought that baldness comes early to those whose youthful hours are filled up with riots, banquets, and sports. These causes probably act by deteriorating the general health.

Both alopecia præmatura and alopecia senilis are inveterate and progressive, and are not controllable by any treatment.

The Alopecia of Seborrhœic Eczema.

It has long been noticed that marked shedding of the hair accompanies a more than ordinarily rich formation of dandruff. This dandruff is now looked upon by Unna as one of the symptoms of a chronic desquamative inflammation of bacterial origin, called seborrhœic eczema of the scalp, which acts so detrimentally on the hair-forming process that the hairs grow gradually slender and delicate, till at last they are mere down, and finally disappear altogether. Like all inflammatory processes, this seborrhœic eczema has varying degrees of intensity, and Unna distinguishes three clinical types, with their corresponding alopecias:

(*a*) Pityriasis capitis, or branny desquamation of the scalp, accompanied by alopecia pityrodes.

(*b*) Eczema seborrhœicum crustosum, accompanied by alopecia seborrhœica; and

(c) Eczema seborrhœicum madidans, accompanied by alopecia eczematosa.

Ordinarily the alopecia caused by seborrhœic eczema does not commence before twenty years of age, but it may occur as early as at the eighteenth year. In its general progress it resembles closely the alopecias described above as senile and premature. It is symmetrical, as they are; it commences either at the whorl on the posterior and upper aspect of the head, or drives bay-like processes back from each side of the forehead. It is slowly progressive, and ends by clearing the whole top of the head of hair, leaving a small fringe around the occiput. The symptoms, diagnosis, and treatment of these forms of alopecia are, of course, the same as those of seborrhœic eczema of the scalp.

Pityriasis capitis is characterized by alopecia, and by a fine

abundant branny desquamation, consisting of silvery scales that fall on the shoulders like snow. There often is itching, which is sometimes slight, sometimes more marked. The scalp, except for the desquamation, appears to be normal.

In eczema seborrhœicum crustosum the desquamated epithelium has a greater amount of oil mixed with it, than in pityriasis capitis, and it forms dirty white or yellowish crusts, that both look and feel greasy. In rare cases the skin under these crusts is red and moist.

In eczema seborrhœicum madidans there is a chronic catarrhal inflammation of the scalp, with a great deal of moist, oily exudation.

Frequently in eczema seborrhœicum of the scalp, a circinate seborrhœic eczema of the breast or back is found, that helps out the diagnosis.

Diagnosis.—When, on the scalp, diseased patches are found, covered with heaps of tightly adherent silvery scales, which, on being rubbed off, expose a reddened surface with punctate bleeding, there is no doubt it is a case of psoriasis. But psoriasis may occur on the scalp as a diffuse desquamation of silvery scales like pityriasis capitis. Under such circumstances one must look at the other localities where psoriasis patches occur so frequently, as over the elbow tips and over the patellar tendons.

Lupus erythematosus can usually be excluded on account of the scarring which seborrhœic eczema never causes.

The diffuse powdery form of tinea tonsurans is exceedingly rare, especially in adults, and favus in any form is seldom seen in this country, and, besides, it leaves scars. Both tinea tonsurans and favus can be excluded by a careful microscopical examination.

Treatment.—If there is any particular cause of ill health, such as anæmia or chlorosis, it ought to be remedied as far as possible. Asepsis and antisepsis must always be kept in the forefront in any consideration of a disease that, like seborrhœa, is strongly suspected of being parasitic.

It is first necessary to clear the scalp of scales and crusts, and the best way to do this is to shampoo at least once a week with the spirits of green soap. If the crusts are very thick, it may be necessary at first to soften them by soaking oil into the scalp for a few hours. For the daily treatment of the scalp it is usually better to use lotions than salves, as the latter are nasty. The lotion at first should be strongly antiseptic, for the thick standing hairs and the deep glands of the scalp furnish an excellent hiding place for bacteria. One can frequently use a strong bichloride of mercury solution made with dilute alcohol. The alcohol is a necessary ingredient of the prescription, both for its action on the scalp, and also because it

cuts the grease of the skin, and allows the corrosive sublimate to penetrate deeper.

℞ Bichloride of mercury, ... grs. iv.
Alcohol,
Distilled water, ... āā ʒ ij.
M. S. Apply by parting the hair, and rubbing well into the scalp every day, or every second day.

If the soap and the alcohol extract too much oil from the hair, leaving it disagreeably dry, a little olive oil may be used to counteract this.

After the scalp has been well disinfected, a solution of salicylic acid, or carbolic acid, in dilute alcohol may be used.

℞ Carbolic acid, ... grs. x.
Alcohol,
Water, ... āā ʒ ij.
M. S. Apply by parting the hair, and rubbing well into the scalp every day, or every second day.

When the inflammatory reaction is a well-marked symptom, a more soothing application is to be recommended, and the so-called Hutchinson's lotion will be found to act satisfactorily in a great number of cases. This consists of:

℞ Liquoris carbonis detergentis, . . . ʒ iiss.
Liquoris plumbi subacetatis, . . . ʒ ss.
M. S. A teaspoonful in a pint of hot water, to be used as a lotion on the scalp once or twice a day.

Alopecia in the Acute Infectious Diseases.

Alopecia is well known to occur in the acute infectious diseases, as in typhoid fever and in scarlatina. By far the most interesting of these alopecias is that which appears in the exanthematous stage of syphilis.

The loss of hair is seldom universal in syphilis. It may occur, however, and include the hair of the scalp, the beard, the eyebrows and eyelashes, the axillæ, and the genitals, as well as the downy hair of the general surface. But usually syphilitic alopecia manifests itself as a patchy thinning of the hair of the scalp, best seen on the back of the head. Fournier has also drawn attention to a peculiar alopecia of the eyebrows in secondary syphilis, involving the outer half of each eyebrow.

The alopecia of secondary syphilis is only temporary, the hair returning in a few weeks as luxuriantly as ever.

The ulcerative lesions of syphilis, in both the secondary and ter-

tiary stages, inasmuch as they destroy the skin and hair follicles, produce an alopecia that is permanent, and which is entirely different from the alopecia described above.

The treatment consists in the administration of the usual antisyphilitic remedies internally, and in prescribing a lotion of the bichloride of mercury in dilute alcohol for the scalp. Cutting the hair short is undesirable, as it makes the bald patches more apparent, and does not prevent, in the least, the fall of hair.

The Alopecia of Leprosy.

Alopecia is a well-marked feature of tubercular leprosy. The loss of the eyebrows and eyelashes forms part of the group of symptoms that give rise to the leonine expression. Leprosy rarely causes alopecia of the scalp.

Alopecia of Myxœdema.

Alopecia is a well-marked feature of myxœdema, and in advanced cases there may be almost complete baldness, with dirty brown patches composed of dried sebaceous secretion and epithelial scales on the scalp. Byrom Bramwell says that "even in the comparatively early stages of most cases, the eyebrows, and sometimes even the eyelashes, may be absent." The nutrition of the hair is bad; it is as dry as hay, harsh, and without lustre.

The Alopecias Caused by Folliculitis.

A number of inflammatory diseases of the hair follicles have been described, some of which leave the hair intact, while others destroy it completely. Some of these forms of folliculitis, such as that of favus or tinea, for example, are undoubtedly caused by parasites. In others the parasites, if they exist, have not yet been discovered, and their presence is only surmised from the character of the clinical picture. It is safe to say that wherever, in nature, a nice warm nook is found, there will be found a choice variety of parasites taking advantage of the comfort offered. Although the hair follicles are lined by the hardest epithelium of any of the glands, and the outermost cells of the hair are so fashioned as to sweep the follicle as the hair grows outward, the hospitality is only comparatively bad for a lodger who is persistent and hardy enough for the place. And besides, there is the sebaceous gland near by, opening into the hair follicle, and overflowing with fatness. A number of parasites have been discovered in this locality, and the chances are, that with better means of search, many more will be brought to light.

It will not be attempted here to take up the subject of all the varieties of folliculitis, but to mention some of them in which alopecia is a prominent feature.

Ulerythema Ophryogenes.

This disease was first described by Tänzer in Unna's clinic, in 1889, and a number of other cases have since been reported from the same clinic.

The lesion consists of the formation of a horny epithelial plug in the mouth of the hair follicle, with a slight redness, like that caused by an insect bite, around it. The hair itself is either broken off short just above the level of the skin, or abnormally fine, or not at all visible. The affection occurs most frequently in the eyebrows, especially in the outer half, and crawls up over the forehead into the hair, and downwards over the cheeks, neck, and outer surfaces of the arms. The process is very slow, ends in the complete destruction of the affected follicles, and leaves a fine network of cicatricial tissue.

The fact that the disease occurs in foci in the hair follicles, and has a tendency to spread to neighboring follicles, would indicate that it is, as Unna thinks, a parasitic disease. Its treatment therefore would be directed to the destruction of this hypothetical parasite.

Quinquaud's Disease.

This is a purulent folliculitis, that causes irregularly shaped bald patches of variable size on the scalp, but the patches are seldom so large as those of alopecia areata, and they are scattered all over the scalp.

As above mentioned, the process is a purulent folliculitis, forming miliary, discrete abscesses that never become confluent. They are about the size of a pinhead, and each abscess is centred by a hair. The hair is quickly destroyed, and falls, never to grow again. After the abscess heals, the site of the affected hair sac and its sebaceous gland is occupied by a cicatrix.

Treatment.—Quinquaud directs that the scalp be well cleaned with soap and water, and that every day the following lotion be sopped on the affected patches:

℞	Bichloride of mercury, ...	1.00
	Biniodide of mercury, ...	0.15
	Alcohol, ...	60.00
	Distilled water, ...	500.00

M. S. To be used as a lotion once a day.

Once a week the patches should be painted with tincture of iodine.

ALOPECIA FROM GROSS NUTRITIVE DISTURBANCES IN THE SKIN.

Alopecia may result from a gross nutritive change in the corium. In acute eczema there is frequently a marked fall of hair which A. R. Robinson thinks is from a saturation of the tissues with serum. In erysipelas also there is alopecia, possibly from the same cause.

When the blood supply to a piece of skin is cut off, or decidedly diminished, the hair falls out in the area affected; for instance, the hair falls out of the scalp over a large wen. The alopecia in patches of scleroderma and morphœa seems also to be owing to the diminished blood supply in the sclerosed skin.

ALOPECIA AREATA.

Synonyms.—Area Celsi, or simply area.

Definition.—A sudden and complete fall of hair occurring in patches, with no or very slight symptoms of inflammation in the skin of the affected areas.

Symptoms.

When first observed, there is usually one bald patch the size of a ten-cent piece or thereabouts, which has appeared suddenly without any subjective symptoms whatever. Sometimes the patient on waking up in the morning finds quite a number of hairs on the pillow, and going to the looking-glass sees the characteristic white bit of bare scalp. The affected area is round or oval, and well circumscribed. At the borders of the patch, when it is extending, some of the hairs are short, and can be easily pulled out. If these hairs are examined under a low-power lens, they can be seen to have atrophied dart-like roots, the so-called exclamation mark (!) hairs of Crocker. Sometimes, when seen early, a whole patch may be found covered with these stubbly hairs, which, however, drop out in a few days, leaving the characteristic denuded spot. The bald area usually enlarges quickly, sometimes slowly, by peripheral extension; a symptom which A. R. Robinson[11] rightly accentuates in discussing both the diagnosis and the etiology of this disease. Occasionally a patch will form a bay-like extension at one part of its periphery, instead of increasing symmetrically. The affected portion of the scalp does not differ either in sensation or temperature from the surrounding integument; it is generally dead white in color, and appears to be sunken and thinned. Unna attributes this sunken appearance of the bald spot not alone to the loss of the hair, but also to a slight œdema of the surrounding tissues. In rare instances the skin is slightly

swollen, pink, and doughy. A single patch may appear, and it may extend very little; but usually, shortly after the first area is seen, others arise and extend, possibly coalescing and forming huge clearings totally or almost entirely devoid of hair. In fact the process may go on, so as to strip every hair, not alone from the head, but from the entire integument.

The bald areas after a few weeks become covered with a fine white down, several crops of which grow and fall before hair of normal size, strength, and pigmentation springs up. Complete restitution may be delayed for years, but finally does occur in the vast majority of cases. In some instances, however, traces of the foregoing alopecia areata are never entirely wiped out, the hair being either more scanty or more frail or less pigmented than normal. The disease has a decided tendency to recur, doing so, according to Sabouraud," in about fifty per cent. of the cases.

Etiology.

Sex has no particular influence on the occurrence of this disease, as it appears in about equal frequency in those of both sexes. It is seen most frequently among the poorer classes, and it is said that dark-haired people are more liable to it than blonds. As there are more dark people than blonds in the world, and more poor than rich, this is not surprising. Age apparently has a decided influence, as the large majority of cases happen in persons below twenty years.

It is a fairly common disease, forming, according to Crocker" about 2 per cent. of all cases of skin diseases in England, 1.5 per cent. in Scotland, 3 per cent. in France, 0.5 to 0.8 per cent. in Germany, and about 0.5 per cent. in America.

There are two views held of the origin of alopecia areata; one that it is a trophoneurosis, the other that it is the effect of a parasite. There is no doubt that many cases that have been described as instances of alopecia areata are examples of trophoneuroses, and this has given just occasion for both A. R. Robinson and Crocker to call for more accurate descriptions of cases and a keener differentiation from mimicking affections.

There are a great number of clinical observations pointing strongly to a parasitic origin, and clinical facts must prevail, especially in the presence of merely negative evidence to the contrary. Another point ought also to be considered here, that although the hairs have been fruitlessly examined for parasites numberless times, and by trained observers, yet the investigation of the affected scalp has been unaccountably neglected.

Many epidemics have been observed where there were great aggregations of people using common toilet utensils; especially have they occurred in army barracks in France, where the infection was supposed to be distributed by the instruments of the army barber. There have been epidemics also in schools, supposedly spread in the same manner. As the disease is usually seen, however, it must be admitted that it is utterly impossible to follow back on the track of the infection. The writer of this article has tried again and again to connect it either with other cases of alopecia, or with tinea tonsurans, or with mangy animals, but only in one instance was there exposure to ringworm at the time of the onset of the disease, and in that case spores resembling those of tinea were found at the root of one of the hairs taken from the periphery of a growing patch. In that case no mycelium could be demonstrated, and without mycelium the tinea fungus cannot be diagnosed. The occurrence of the disease in patches that appear, not simultaneously, but at different times, looks like the effect of parasites developing independently in several foci. The circular or oval shape, the peripheral steady increase in size of each area, and even its increase at one border, while the rest of the periphery remains at a standstill, might all indicate the concentric spread of a parasite. The absence of the symptoms of inflammation does not count for much against its parasitic origin, as sometimes, when the patches are seen early, there is a faint pink color and doughy œdema, and it must be remembered that the hair papillæ are very deep, and therefore a deep inflammatory process affecting them could exist, and even be of considerable intensity, without giving much evidence, on the surface, of its existence. The tendency to recurrence shown by the disease, while explicable by either theory, is nevertheless no unusual feature in parasitism.

The evidence against its being a neurosis is, as so clearly pointed out by Crocker,[14] very strong. It would be strange, and not supported by any analogy, to have a degenerative neurosis so common, and in the prime of life, and while the patients are almost always in the enjoyment of perfect health, and furthermore to have it without any other symptoms whatever, such as errors of sensation or trophic disturbances referable to the supposedly affected nerves. The patches also do not follow the track of any particular nerve.

Crocker supposes the parasite to be the ringworm fungus, but it is scarcely conceivable that it can be this or any of the other mycelium-forming or true fungi. We would have to suppose such a fungus to be situated in the hair or hair follicle, and it can hardly be conceived that it could exist in such a situation, and yet have escaped the eyes of so many careful observers, looking for it in so

many thousands of cases as have been examined with this end in view. The fall of the hair is so obvious, the search for the parasite is so easy, and the form and situation of the disease so suggestive of the presence of such a parasite, that it has been searched for again and again, and almost always with negative results, and the few positive findings can easily be ascribed to accident. Since the introduction of the new methods of staining, the ground has all been gone over again, but with no better success.

A curious misunderstanding has arisen with regard to the position on this question of Gruby, the discoverer of the ringworm fungus. Sabouraud[11] has lately straightened out the tangle, and gives the following interesting details:

In 1843 Gruby described the microsporon Audouini. He clearly recognized its specific character, and therefore the specific nature of the disease caused by it, *la teigne tondante à petites spores* of Sabouraud. Unfortunately Gruby called the disease caused by this parasite porrigo decalvans, a name applied up to his time to alopecia areata, and the confusion so introduced has been continued by writers ever since, each one declaring that Gruby had described a cryptogamic parasite in alopecia areata, that did not exist at all.

There have been several reports of the finding of fungi in alopecia areata, and by competent observers, but the cases are so isolated and so few in comparison to the number of examinations made, that they must be, as before said, looked upon as accidental circumstances. Having determined that the disease is due to a parasite, and having exluded the probability of this parasite being a true fungus, there remain for consideration the bacteria or micro-organisms proper. There have been several reports of a positive nature in this direction, but none of them has received that confirmation from other workers that one always looks for in such investigations. Of course the finding of bacteria in such an open structure as the hair follicle does not lead very conclusively to the idea that such bacteria are the cause of the disease in which they are present, and neither does the failure to find them in the tissues exclude even the probability of their presence, as the same may be said of many diseases universally admitted to be of bacterial origin, as syphilis for instance.

A. R. Robinson has found micrococci, similar in size and shape to the pyogenic bacteria, deep down in the lymph spaces of the recently affected skin, but Unna has failed to confirm this report. Investigation, however, in this direction promises so much, and has been so little tried, that either new findings or a confirmation of Robinson's observations may be expected.

Pathological Anatomy.

The changes in the hair itself are those of simple atrophy, and throw no light on the cause of the disease.

At the very edge of a growing patch there are some short hairs, about one-eighth of an inch in length, which are dry, brittle, and lustreless. They almost fall out when pulled on, have a very small root, and contain much less pigment toward the root than at their distal extremity. These are the so-called exclamation mark (!) hairs. There are still other hairs, which are normal in length and in general appearance, but are easily pulled out, and are also found to have atrophied roots.

The pathologic findings in the scalp itself have been very variable. While Jamieson and some others have found nothing to speak of, Leloir encountered degeneration of a nerve in one case, while in another the nerves were apparently perfectly sound. Giovannini and Robinson, however, who have examined a great number of cases, both agree that there are inflammatory changes deep down in the scalp. Robinson found these inflammatory changes in foci that bore no particular relationship to the hair follicle, while Giovannini saw the inflammatory infiltration especially around the very bottom of the hair sac. One would infer from both investigators that the morbific agent ought to be sought for in the region of the inflamed tissue. Sabouraud[13] has also lately stated that alopecia areata is not to be looked upon as a disease of the hair at all, but of the corium or true skin. In this case the inference would be that the fall of hair is only a symptom caused by the nutritive disturbance.

Diagnosis.

The most important affections from which to diagnose alopecia areata, both from a scientific and from a practical standpoint, are the neurotic alopecias with which it has so long been confused.

Quite a number of cases of rapid universal alopecia have been reported following blows on the head, and these would be very difficult to differentiate from those cases of alopecia areata that rapidly become universal. The main thing to bear in mind is the existence of those alopecias from shock, and also the history of a severe blow on the head. On the other hand cases of rapidly progressive universal alopecia areata always have a history of the existence, for a longer or shorter time, of the usual circular or oval bald spots on the head or face.

In another class of neurotic alopecias the fall of hair follows in-

jury to some particular nerve, is distributed along that nerve, and is frequently a thinning instead of a complete defluvium of the hair.

Quinquaud's Disease.—Quinquaud's disease is a destructive folliculitis where miliary abscesses form in the hair follicles. These abscesses are about the size of a pin's head, and pierced through their centre by a hair, which can be easily pulled out. The hair is quickly destroyed, and soon falls spontaneously, never to grow again. After the disease has gone over a portion of the scalp, the integument is smooth, white, thinned, and depressed. The patches of baldness so caused are irregular in contour and of variable size, but are seldom so large as those of alopecia areata.

Syphilitic Alopecia.—In the baldness of secondary syphilis the patches are rarely entirely denuded of hair. The hair is simply thinned out so that the white scalp shines through. Besides, syphilitic alopecia occurs in the exanthematous stage of lues, when the roseola, papules, mucous patches, etc., are present, and when the memory of the recent chancre is still fresh.

Ringworm.—Those cases of alopecia areata where the hair becomes short and stubbly instead of falling out are liable to be mistaken for tinea tonsurans. The scalp in ringworm, instead of being dead white as in alopecia areata, is grayish-looking, and the affected hairs are stuffed with mycelium and spores.

Treatment.

Almost all the methods of treatment proposed for alopecia areata are directed either to the stimulation of the presumably dormant trophic nerve influence, or to the extermination of the hypothetical parasites. As most of the parasiticides are also stimulants, any benefit claimed may be attributed either to nerve stimulation or to bactericidal action. In fact, as particularly accentuated by A. R. Robinson, a stimulant may act indirectly as a parasiticide by attracting to the diseased part a larger supply of bacteria-killing serum and leucocytes.

In forming an opinion of any treatment, the average success in a number of cases must be taken, as the disease differs widely in its severity, and as almost all cases tend to recover spontaneously. This tendency to spontaneous recovery makes this a favorite disease among hair-nostrum venders. Having once adopted a plan of treatment, it should be kept up for a couple of months at least, as hair growth is slow, and the growth of the first and even the second crop of puny hairs is very deliberate in a patch of alopecia areata.

As regards constitutional treatment, many believe that arsenic is of value. It is well to remember that if arsenic is useful it probably

acts only as a tonic, for there is no reason to think that it acts specifically in alopecia, as it seems to do in chorea and in psoriasis. Hutchinson has pointed out that arsenic in small doses acts as a tonic, but in large doses is a depressant, so that two minims of Fowler's solution given after meals and well diluted would be a large enough dose in alopecia areata. It may be given in cod-liver-oil emulsion if desired.

Almost all observers unite in thinking that local treatment is of more importance than constitutional, and the earlier it is commenced and the fewer are the patches, the better is the prognosis.

If the disease is parasitic, then it is fair to assume that the virus is probably widely distributed in or on the patient's integument, although in only a few patches is the skin so profoundly affected as to give rise to appreciable symptoms. We also know that parasites have their favorite locations, as the tubercle bacilli in the lungs and bones, the lepra bacilli in the skin and nerves, and therefore, if a parasite is present in this disease its favorite location is undoubtedly the scalp. Acting on the theory therefore that the disease is due to a widely distributed virus, with especial accumulation at the points where the symptoms manifest themselves, I have adopted the following treatment, which seems to give good results. One lotion is made of—

℞ Bichloride of mercury, ... grs. iv.
Alcohol, ... ʒ ij.
Water, ... q.s. ad ʒ iv.
M. S. To be rubbed into the entire scalp, face, and neck every day.

After this another lotion is used which is composed of—

℞ Bichloride of mercury, ... grs. iv.
Alcohol,
Spirits of turpentine, ... ää ʒ i.
M. S. To be well rubbed into the bald patches, and a little beyond, every day.

If the disease is more extensive, the treatment must be correspondingly applied, bearing in mind the danger from the absorption of a large quantity of turpentine. I have never seen any disagreeable symptoms attributable to the absorption of mercury in this treatment.

Both A. R. Robinson and Crocker advise the use of chrysarobin made up as a very strong ointment with from fifteen to sixty grains to the ounce of lanolin, vaseline, or lard. It has the drawback of causing at times a severe dermatitis, that may give rise to much alarm, as the œdema may close the patient's eyes. It should never be applied to the eyebrows. A. R. Robinson says that it is the best treatment

for recent cases, and also gives good results in many of long standing. Croton oil has also been recommended, especially on old patches. It is a powerful stimulant, but it may cause a suppurative folliculitis resulting in permanent destruction of the hair sac. A twenty-five or fifty per cent. preparation, made with olive oil, is strong enough.

Sabouraud, while maintaining that alopecia areata is not a disease of the hair at all or of the epithelial covering, but of the true skin, has proposed a treatment calculated to reach the real seat of the affection. He first paints the patch with a blistering fluid to remove the superficial layers of the epidermis, which, he says, form an almost impermeable covering for the skin, and scarcely allow a medicament to penetrate to the deeper layers. Having removed the top of the blister, he paints the raw surface with nitrate of silver solution (1 : 15). He claims that he gets more rapid results by this method than by any other, but is not prepared to say what effect it has on the tendency of the disease to recur.

Canities.

The color of the hair is due to two factors, the pigment it contains, and the clear yellow color that every albuminous body assumes when dry, the yellow that we are so accustomed to see in horn.

Some observers say that the brown or yellowish-brown hair pigment is formed in the corium, and is taken from the corium and introduced into the hair bulb by large cells similar in appearance to the pigment-forming cells of the true skin. The pigment having entered the hair bulb exists there as intraepithelial granular, and interepithelial diffuse pigment. As the hair grows out, it carries this pigment with it. Schwalbe, however, thinks that epithelial pigment, and therefore hair pigment, is formed in the epithelial cells themselves, and is not carried in from the connective tissue to be deposited in and between the epithelial cells. He furthermore believes that the pigment of epithelium is not obtained from the hæmoglobin of the blood, but is precipitated from the yellow pigment of the blood serum.

Gray or white hair is due either to absence or diminution of pigment, or to the presence of microscopic air bullæ between the hair fibrillæ, or to both these factors. When hair is white from the absence of pigment alone, it is dull yellowish-white, owing to the tint of the dry albumin of which it is composed. The glitter of steel gray or of silvery white hair is due to the high refractive power of the minute air bubbles that lie in the substance of the hair.

Congenital Canities.

In albinos the hair is white, and it may be general or partial, corresponding to the distribution of the albinismus. More frequently, however, partial congenital canities is unassociated with albinismus, and shows itself as a tuft or tufts of silvery or yellowish-white hair in the scalp or beard, springing from a normally pigmented skin.

In regard to inheritance, albinotic canities follows the same course as albinismus, that is to say, it is exceedingly rare to find the parents of albinotic children albinos, yet some peculiarity in the parents must produce the anomaly, as, in such families, usually more than one child is an albino.

Although neither albinismus nor its accompanying canities is markedly hereditary in the usual acceptance of the term, yet, curiously enough, the occurrence of a tuft of white hair, in some particular situation, has frequently been found to run in a family. A number of such instances have been reported under the title of poliosis circumscripta hereditaria. Seligsohn [16] observed a white lock on the anterior part of the head of four brothers. Stricker [17] found a white lock on the forehead, inherited through six generations. This was direct inheritance, and no reversion was observed. John H. Morgan [18] saw a small bunch of perfectly white hair springing from the forehead, which had been hereditary through four generations.

Acquired Canities.

It is physiological for the hair to turn white after a certain age, about forty years, but here also, as in congenital canities, heredity plays a part, for in some families it is usual to turn gray young.

Sudden blanching of the hair from fear or some other great emotion has always been a favorite subject with story tellers, but people of a critical turn of mind have been slow to believe these wonderful tales, as they would indicate an almost incredible influence of the nervous system on such an inert substance as hair. Nevertheless, so many instances of this phenomenon have been recorded by competent observers that it seems absolutely settled that it can occur. Other disturbances of the nervous system, such as neuralgia, can also cause grayness of the hair, as in a case reported by Cantrell.[19] The clinical observation that grayness can follow neuralgia, and that it may be sudden, would be confirmatory of the idea that great emotions and shock may bring about the same result. As evidence of nerve influence in the production of canities Crocker cites [14] cases reported by Nettleship, Hutchinson, and Jacobson where the eyelashes have

turned white in sympathetic ophthalmitis following destruction of the opposite eye. Before accepting such an explanation, however, such cases require to be carefully looked into, as inflammatory reaction alone seems to be capable of turning the hair gray. A case reported by Adolf Schenkl [20] is instructive in this regard. Some of the eyelashes of the upper lid turned gray shortly after enucleation of the eyeball for inflammation following a traumatism. The decolorization did not follow immediately on the blow, but came on later, and the observer thought it was due to the inflammation.

The grayness sometimes observed to follow erysipelas may also not be a trophoneurosis, but may arise from nutritive disturbance caused by inflammation.

The constant canities of the hairs that first grow in a patch of alopecia areata is one of the strongest arguments of those who believe the disease to be a nerve lesion, and not due to a micro-organism. It still remains a strong argument, for, although, from the foregoing instances, it would appear that canities can be produced by inflammatory reaction alone, and evidences of inflammation have been found in alopecia areata, yet canities as a sequence of inflammation in general is so rare that something more than inflammatory reaction *per se* would have to be adduced to explain the constant occurrence of the white hairs in alopecia areata.

Ledermann presented a man twenty-four years of age to the Berlin Dermatological Society in January, 1895,[21] whose hair turned white in six weeks. The hair of the head and of the beard was first affected, then that of the thorax, left axilla, and pubis. There were neither hereditary nor nervous influences to account for the phenomenon.

In vitiligo, the essential characteristic of which is a loss of the natural pigment of the skin, the hair in the affected places also lacks pigment, and becomes white. Hallopeau and Salmon, and shortly afterwards Gaucher have reported cases [22] of vitiligo associated with corresponding canities on localities that had been subjected for a long time to the pressure of a truss. Gaucher says such cases are not so rare, and Jullien says the condition is frequently seen on the trunk of women subjected to the pressure of the corset.

It is usual for the white hairs following alopecia areata to regain their color, but otherwise hair, having once turned white, almost always remains so. Some few cases have been reported, however, in which the color has returned. D. W. Prentiss has reported one where it returned after using jaborandi.

There is practically no treatment for canities but to dye the hair. Most of the hair dyes are harmless. The lead ones have the worst

reputation, but it is difficult to see how they can be toxic. We employ lead much more freely, and for months at a time, in the form of diachylon ointment, without getting any bad effects from it.

Very few doctors, myself among the number, have any experience with hair dyes, but it may be well to give a few of those most commonly recommended, so that when occasion arises the physician may have them ready to his hand. Many of the following facts are taken from Paschkis' work on cosmetics," or from Kaposi's work on diseases of the skin.

To dye the hair black: After the oil has been well removed from the hair by rubbing into it tincture of green soap, and washing in hot water, the hair is divided off into strands, and each strand is well smeared with a stiff paste made of henna powder and lukewarm water. The paste is washed off with warm water, after being allowed to remain on about one hour. When the hair has partially dried, another paste made with water and indigo powder is applied in the same way and for the same length of time as the first, and then washed off also. The henna tints the hair orange red, which is changed to a greenish-black by the indigo, which in turn quickly changes, through the oxidation of the indigo, into a deep blue black. It is said that one can get a black, brown, or chestnut color with the henna and indigo process by varying the proportions of the ingredients.

Neither henna nor indigo is harmful to either the scalp or the hair, and the dye is very tenacious.

For blacking the eyebrows soft black crayons may be used. Brocq recommends the following as a pomade for blacking hair:

℞ White wax,	125.00
Olive oil,	300.00

Melt together and add

Poplar-wood charcoal,	60.00

S. Apply when necessary.

Nitrate of silver is said to be one of the best preparations for dyeing the hair. It may be employed dissolved in a liquid, or used as a pomade. The following is recommended:

℞ Nitrate of silver,	5.00
Acetate of lead,	1.00
Rose water,	100.00
Cologne water,	1.00

M. S. Apply as directed.

Before applying the above, the hair should be well washed to remove all the oil. Then the hair should be thoroughly dried, and the silver solution applied. The scalp should be washed immediately

with salt water to prevent staining by the silver. After a time the color fades to a greenish or reddish tint, with especial rapidity when the oily substances have not been well washed out of the hair before applying the silver solution. If any spots of silver staining are made on the skin during the dyeing process, they can be removed with a solution of iodide of potassium or with a solution of cyanide or ferrocyanide of potassium.

The following is an ointment for coloring the hair black:

℞ Nitrate of silver, ...	1.00
Carbonate of ammonia, ...	1.50
Emollient ointment, ...	30.00

M. S. To be applied as required.

Ringed Hair.

Synonyms.—Pili annulati, leucotrichia annularis, trichonosis versicolor.

In this condition the shaft is marked off into alternate white and pigmented segments, giving it the appearance of being ringed. There has also been found a slight increase in the diameter of the shaft at the white portions.

This extremely rare condition was first described by Karsch in 1846, who gave it the name pili annulati. Karsch's case was afterwards described by G. Simon, Spiers, and Landois, and the two last-named observers showed that the white segments were due to the presence of bubbles of air in the cortex, and not to a want of pigment. The air bubbles, by reflecting all the light, caused these parts to look silvery white. This increased porosity of the hair at the affected parts was found to give rise to a slight increase in the thickness of the shaft.

Unna has observed a case of this disease associated with white spots on the nails, and draws attention to the fact that the presence of small air bubbles is the cause of the peculiar appearance in both affections. He thinks that the cause of the increased porosity in both is an abnormal succulence of the young epithelial cells at these points, and that when this epithelium dries it does not dry down solid as it should, but remains porous.

Diagnosis.—Ringed hair is most liable to be mistaken for monilethrix, for in both the shaft is nodose and ringed. But the thick portions of the shaft in monilethrix are the normal portions, and the difference in diameter between the thick and thin segments is much greater in monilethrix than in ringed hair.

Heredity has not been found to play any part in ringed hair, while monilethrix is hereditary in a marked degree. The important

thing to keep in mind, however, is that ringed hair is simply an intermittent porosity of the hair, while monilethrix is an intermittent thinning and aplasia of the hair.

The white rings and the slightly thickened parts of the shaft are coincident in ringed hair, while in monilethrix the thinned segments are white. In leucotrichia annularis the hair is normal in amount and in length, and the skin is unaffected, while in monilethrix the hair is scanty, short, and brittle, and the skin presents the peculiarity called keratosis pilaris.

Temporary Change of Color of the Hair.

Besides the instances in which the hair has turned white, and after a time returned to its normal color, there are a few cases on record of temporary change of color of the hair. One of these, reported by C. Reinhard,[24] was a case in which, during an epileptic attack, the hair used to change gradually from light yellow to golden, and back to light yellow again, the whole process taking place in from two to three days. The patient was a female idiot. Another case, also in an idiot, but a man this time, was reported by Raeuber.[25] After a fit his dark blond hair became fox red. It, at the same time, became kinky and lustreless. The hair returned to the normal again in about one week.

Fragilitas Crinium.

Those solid or medullated bars of keratinized epithelium that we call hair, must draw their nutrition from the hair papillæ or from the succulent epithelial cells lining the hair follicles. In any case the nutrition for the more distant parts of the hair has a long and difficult journey, and one finds, as one would expect, that any deterioration of the general health is quickly reflected in the hair. Therefore in diabetes, in fevers, and in tuberculosis the hair becomes dry and lustreless, and is apt to fall out and to split.

Fig. 55.—Areas of Disease in Duhring's Case of Fragilitas Crinium, in which the splitting of the hair took place within the hair follicle. A diagram made from Duhring's description and submitted to him for verification.

Fragilitas crinium may therefore occur when there is an obvious deterioration in health, but it may also exist when the general health, as far as one can see, is in excellent condition. The splitting is usually seen at the ends of the long hair of women, or in the hairs

of the beard of men. The hair of the beard has been known to split right down into the follicle, as in the case reported by Louis A. Duhring.[4] In Duhring's case the patient was very nervous and the patches of hair affected were accurately symmetrical, leading one to suspect that the affection might be a trophoneurosis. The split hairs irritated the follicles so as to give rise to folliculitis.

Daily shaving was beneficial, but not curative, in this case.

The Nodular Diseases of the Hair.

There are several diseases of the hair which, though differing widely in their real nature, have yet the important clinical fact in common that they give rise to inequalities, or nodes, along the hair shaft. These affections are: accumulations of ordinary dirt; the nits of insects, particularly of the pediculus capitis; piedra; lepothrix; trichorrhexis nodosa; and monilethrix. Accumulations of dirt hardly require discussion, and the consideration of pediculosis belongs to another article in this volume.

Piedra.

Definition.—A disease characterized by hard nodules encircling the hair shaft at irregular intervals, and caused by agglomerations of an epiphytic fungus. The name piedra (a stone) was given to the disease by Dr. Osorio. Juhel-Rénoy has proposed the name of trichomycosis nodosa.

Historical Sketch.

Dr. Nicholas Osorio, of Bogota, first described this disease in 1876 and said the nodes were formed by a heaping up of the epithelium of the hair itself. Hairs were sent by Dr. Gutierrez, who had also supplied Osorio, to Malcolm Morris, of London, and Desenne, of Paris, and Alfred Sangster sent some of Morris' supply to Gustav Behrend, of Berlin. All three of these gentlemen, E. Desenne,[5] Malcolm Morris,[6] and Gustav Behrend,[7] came to the conclusion, since more fully confirmed by Juhel-Rénoy, Lion, and Gustav Behrend, that the disease is due to a parasite, a mycelium-forming fungus. The later investigations of Juhel Rénoy, Lion, and Behrend were made on hairs furnished by Andreas Posado-Arango, of Medellin, United States of Colombia.

Clinical Appearance.

The hair has a frizzled "kinky" appearance; upon being combed, gives out a fine, crepitant noise; and minute, nodular, firmly

seated inequalities can be felt when the shaft is drawn through the fingers. These nodules give the impression of nits, but are very much smaller, and are sessile, not standing out from the shaft like a nit but lying down close to it, and in many instances completely encircling it. Under a low power of the microscope the nodules can be seen partly or completely encircling the shaft. They are of a dark chestnut color, and are sufficiently transparent to permit the hair shaft to be seen through them.

The disease never affects the scalp or the hair follicle, but begins usually about a quarter or half an inch from the root, and is scattered irregularly along the shaft of the hair to the tip.

The name piedra, a stone, is apt to be somewhat misleading, as one would expect the nodes to have some stony or earthy particles in them. They are firm and resistant like hardened wax, but when cut do not creak under the knife, and have no gritty particles in them. At least those characteristics were not present in the specimens examined by Juhel-Rénoy and by Behrend, the two men who have given us the most thorough studies on this disorder. On the other hand, the nodules on the wisp of hair examined by Malcolm Morris were hard and smooth, and were almost incapable of being cut by an ordinary knife, and the hair, upon being beaten against glass, gave a rattling noise.

The disease is caused by the growth on the hair of a true fungus, consisting of mycelium and spores. The piedra mass is made up, for the most part, of oval spores, with a few irregularly shaped ones, and some short, thick rods, together with dirt, grease, and an amber-colored glutinous material formed by the fungus itself, and which holds the whole mass together, and causes it to adhere to the hair shaft. The fungus elements do not penetrate the hair, as do those of tinea and favus, but simply adhere to it, or, at most, the cuticle of the hair is raised.

Piedra is most frequently found in the United States of Colombia. Behrend[*] has run across one case in Germany, and says that the affection described by Beigel as "chignon disease," which at one time seems to have been quite common in Europe, is undoubtedly identical with piedra.

The epiphyte, the cause of the disease, can exist on the hair only under particularly favorable conditions, and its almost invariable location is on the hair of the head. Because those favorable conditions are seldom present except in women, the disease is almost exclusively confined to that sex, being very rare indeed in the hair or beard of men.

The particularly favoring circumstance in Colombia is the cus-

tom of using linseed water (linseed tea) to make the hair shiny and smooth. This mucilaginous substance makes a favorable culture medium for the fungus, and as fashions in hair-dressing are most assiduously followed by young girls this affection is most frequently encountered in them, though it has also been seen in women over sixty years of age, and, as before mentioned, in men.

Piedra exists in different climates, and, according to Juhel-Rénoy, temperature does not exert any influence on it.

According to Posado-Arango, who furnished the hairs that Juhel-Rénoy and Lion examined, there is no doubt that the disease is contagious, and he gives the case of a little girl who contracted it, probably at school, and who communicated it to her two sisters.

The disease appears to last for an indefinite time, probably as long as the conditions are favorable.

Diagnosis.

Piedra must be diagnosed from the other conditions causing inequalities along the hair shaft, which are due merely to collections of dirt, to the nits of pediculi capitis, to collections of other fungi or bacteria, or to essential anatomical changes in the hair.

Only a very superficial examination is necessary to diagnose this affection from inequalities caused by accumulations of ordinary dirt, or by nits.

Lepothrix occurs in the axilla and on the scrotal hairs, where there is much heat and moisture, and not on the head or beard. It is caused by a coccus, and not by a mycelium-forming fungus, and occasions so little inconvenience, either cosmetic or symptomatic, that the patients are usually not aware of its existence.

Trichorrhexis nodosa occurs almost always on the beard, the nodules are grayish colored, the hair is brittle, and under the microscope the fibrillation of the hair shaft can be seen to form the essential feature of the disease.

The pubic trichorrhexis nodosa of Raymond is the same as ordinary trichorrhexis nodosa in its general features, but it occurs on the hair of the genital region, and has been found by Raymond to be due to a coccus which erodes the hair cuticle, allowing the hair to split up into fibres.

Monilethrix is a nodular disease of the hair, but it is congenital and hereditary, and is most obvious on the hair of the head; the patients are almost bald and have an accompanying keratosis pilaris, and under the microscope the nodular condition can be seen to be caused by thinning of the hair shaft itself at regular intervals.

Treatment.

The following treatment, which has been recommended by Juhel-Rénoy, would no doubt be efficacious. It is not at all clear, however, that the majority of the people having the disease, have any very ardent desire to be rid of it. Juhel-Rénoy has found that corrosive sublimate, 1 :1,000, is a very active poison for the fungus, and recommends it to be used in a hot solution—the hot water easily softening the nodules and allowing the bichloride of mercury to penetrate. The nodules have been found to be easily softened by alkalies, and therefore soap would be a useful adjunct to any treatment.

GIOVANNINI'S DISEASE.

Sebastiano Giovannini, of Bologna, has reported a case[30] which ought to be considered here, because it was one of a nodular disease of the hair caused by a true fungus.

Small, firmly adherent nodules appeared repeatedly on the hairs of the right half of the patient's mustache, and nowhere else. The nodules consisted of a dense mass of brilliant granules looking like spores. This mass was seated firmly on the hair cuticle, without, however, any of its elements penetrating the hair substance. The spore-like bodies had a dense, double-contoured membrane, and homogeneous, highly refractive contents. Other spores could be seen in mycelial threads, and these threads were branched. There was no doubt, therefore, that the parasite was a true fungus, and also no doubt that it did not belong to any of the ordinary pathogenic fungi, such as that of favus, ringworm, or pityriasis versicolor. Unfortunately the fungus could not be cultivated nor could the disease be transmitted. Giovannini thought that it was one of the many non-pathogenic fungi that are so frequent in food, and that it found, for some unknown reason, favorable conditions for its growth on the right side of this man's mustache. Uncleanliness as an etiological factor would seem to be excluded on account of the patient's social position, as he was a prominent politician and savant. The fungus was quite different from that found by Juhel-Rénoy and Lion in piedra.

LEPOTHRIX.

Derivation.—Lepothrix, from λέπος, a scale, and θρίξ, a hair.

Definition.—A growth of bacteria giving rise to more or less firm masses on the shafts of hairs macerated by sweat, as those between the thigh and scrotum, and those in the axilla.

Symptoms.

If the hairs of the axilla or of the scrotum be examined there will often be found small grayish-yellow, firm nodules scattered along the shaft; other hairs will be unevenly thickened, roughened, and lustreless from their point of emergence from the skin to their tip. In summer when the hairs are moist with sweat, these deposits are much softer, but at no time can they be slipped along the shaft. When hairs so affected are allowed to dry, the masses on them shrink and become very hard, and then the hair is more easily broken, otherwise the foreign coating does not seem to affect either its consistence or its rate of growth, and there are no other symptoms connected with the affection.

Etiology.

According to Gustav Behrend if a large number of people be examined fully twenty per cent. of them will be found to have this affection; but as it does not give rise to any troublesome symptoms whatever, they do not apply for treatment. As it is almost never found on the hairs of any other part of the body than of the axilla or scrotum, and as warmth, perspiration, and much sebaceous matter are the characteristics of these regions, it can be inferred that these are factors favoring the development of the disease.

In this affection the colonies of micro-organisms occupy a peculiar location, and in order to understand it, the anatomy of the hair cuticle must first be considered. The cells of the cuticle are arranged like the shingles on a roof, but in the reverse direction, however, the free edge being directed towards the tip and not towards the base. These cells, when macerated by heat and sweat, become loosened up and flared out, and the micro-organisms grow under and on them like moss on a roof. When the hair cuticle is broken up and weakened in this manner, fibrillation of the hair cortex takes place, offering further roughnesses for bacteria to grow on. In no case do these micro-organisms seem to draw their sustenance from the hair itself, but simply from the waste substances thrown off from the hair and the skin, and the excrements from the sweat and the sebaceous glands. Neither the hair-root nor the neighboring skin is affected. The micro-organisms are simply epiphytes living on the hair, and drawing their sustenance from the droppings and waste products of the body.

The practical value of a knowledge of this disease is that the physician is enabled to assure his patient that he is suffering from an entirely innocent affection, and also when treatment is desired it can be more intelligently directed.

Treatment.

The parts should be well washed with soap and hot water, and then as a lotion—

℞ Bichloride of mercury, ... grs. viij.
Dilute alcohol, ... ʒ iv.
M. S. To be sopped on, either with the hand or with absorbent cotton, once a day after washing.

The alcohol in this lotion is to cut the fat, allowing the parasiticide to penetrate more easily and therefore serves the same purpose as the alkali in soap. The large amount of corrosive sublimate (1 : 240) in this lotion may be objected to, but it does no harm, and an abundance of the antiseptic is desirable.

MONILETHRIX.

Derivation.—Monile, a necklace, and θρίξ, a hair; a term first proposed by Crocker.

Synonyms.—Moniliform or beaded hair; nodose hair; aplasia pilorum moniliformis vel intermittens.

Definition.—A narrowing or thinning of the hair at regular intervals, causing the intervening normal portions of the shaft to appear fusiformly thickened.

Symptoms.

Those affected with this disease look so bald that the first cases were described as alopecia. The hair is scanty, dry, fine, and brittle, always breaking at one of the contractions when pulled. The shaft at the thinned or internodal portions is whiter, and contains less pigment than at the nodes, giving it the appearance of leucotrichia annularis, from which, however, it must be differentiated. The disease usually affects only the hair of the scalp, and is sometimes confined to a particular region of the head, as the temples, the crown, or the nape.

That peculiar roughening of the skin called keratosis pilaris, caused by a heaping up of the epithelium of the skin about the hair at its point of emergence, is so constantly present and so marked, as to constitute a very important symptom of this disease.

Under the microscope the hair looks as if made up of a lot of spindles placed end to end, each spindle being about 1 mm. in length, and corresponding to the growth of the hair for a single day.

It must not be supposed that the nodules are always of such a size as to be perceptible to the naked eye, and sometimes on a particular shaft no nodules will be present for quite long distances.

Etiology and Pathology.

The affection may be called congenital, for, although the disease is not present at birth, yet it appears so early that it undoubtedly rests on a congenital basis. There are, however, two cases reported, in which the disease seems to have developed late, one by Walter G. Smith,[11] another by Unna (quoted by Sabouraud).[12]

An infant born with this disease starts with a normal quantity of hair, but loses it about the sixth week, and ever after remains bald, having only a few delicate moniliform hairs.

Monilethrix being congenital, it is, as one would expect, hereditary, and in a marked degree. McCall Anderson has observed it in fourteen members of the same family; Payne in two brothers; Hallopeau in five individuals of the same family, running through two generations; Sabouraud[13] in seventeen individuals of the same family, in five generations.

It does not appear to have any special leaning to either sex. Having once appeared in an individual, it is permanent. It does not exist in all the children of an affected parent, and having once disappeared in a line, it shows no tendency to return—that is to say, it does not skip a generation.

No good evidence is extant in regard to its first appearance in a family, but Sabouraud is inclined to attribute it to nervous shock. It was said to have been caused in the great-grandmother of the case he reported by such an accident, and Unna's case, mentioned by Sabouraud, was thought to have this origin also. In Walter G. Smith's case coming on at puberty no history of fright or shock was elicited.

Bonnet[14] says that the narrowing of the shaft is due to a contraction of the circular muscular fibres below the point where the duct of the sebaceous gland opens into the hair sac. The hair below this point is a soft, plastic mass of young cells, and it gets blocked and squeezed in the narrowed opening. The contraction of the circular muscular fibres then relaxes somewhat, allowing the hair to resume its normal size, quickly to contract again, however.

All the evidence is against the disease being due to a contagium. In the first place, its almost constant appearance in early infancy, its persistence throughout life, and its occurrence in families, all point to its being a congenital defect. Then, again, although it does occur in families, unaffected members live in closest intercourse with those afflicted, and for years, without any instance of transference of the disease. Therefore its early appearance in the individual, its occurrence in families, its incurability, either spontaneously or through

treatment, and its non-transference to healthy people, all point to its being an anatomical peculiarity, and not a disease due to a contagium.

Under the microscope the affected hairs are seen to be contracted at regular intervals from the root to the tip. The sebaceous system seems to be in a condition as atrophic as the hair (Vidal); in fact, the pilo-sebaceous system of the entire integument is implicated, but most noticeably so on the scalp.

Diagnosis.

The diagnosis is easy enough as soon as attention is attracted to the real state of affairs and a microscopical examination is made. This condition should be looked for in all cases of congenital baldness—in fact, no examination of such a case would be complete without a search for nodular hairs. In Walter G. Smith's case the hair of the whole scalp was uniformly thinned, and he mentions its similarity to some cases of alopecia in secondary syphilis, but the persistence of the scantiness of the hair would be enough to differentiate it without a further examination.

Monilethrix and trichorrhexis nodosa are the only nodular diseases of the hair that are due to an essential change of form in the shaft itself. All the other nodular diseases of the hair are caused by adventitious circumstances, as the presence of parasites or the accumulation of dirt.

The hairs in monilethrix are dry, brittle, and easily break and fibrillate at the internodal spaces. This fracture characterizes trichorrhexis nodosa, but it is clearly recognizable as being secondary to the other condition. This point being explained, the only resemblance between the two diseases is the occurrence of nodules along the hair shaft. The mode of formation of the nodules is, however, absolutely different, for in trichorrhexis nodosa it is due to a green-stick fracture and fibrillation of the shaft, and occurs at irregular intervals along the hair above its point of emergence from the skin, while in monilethrix the nodes are smooth, solid, and occur at regular intervals from deep in the follicle to the tip. In monilethrix the disease occurs in families, is congenital, and those afflicted are nearly bald, in all of which it differs from trichorrhexis nodosa, which rarely appears except on the beard, and in persons having in all other respects normal hair.

Because of the lack of pigment in the thinnest portions of the hair there is a similarity between monilethrix and ringed hair. Monilethrix, however, ought not to be called ringed hair, because the nodular formation of the shaft is the much more striking feature, and ought to receive the preference in designating the disease.

Treatment.

From the nature of the disease the idea of a cure cannot be entertained. By the judicious use of lanolin, thinned either with vaseline or the oil of sweet almonds, a good deal can be done to ameliorate the condition. This fat can be used in the daily toilet as an auxiliary to the inefficiently acting sebaceous system.

Trichorrhexis Nodosa.

Derivation.—The word trichorrhexis is derived from θρίξ, a hair, and ῥῆξις, a rupture, a bursting forth, and literally conveys the meaning, not of a simple fracture, but of something swelling inside and bursting the hair.

Synonyms.—A. Devergie at the suggestion of Littré called this disease trichoptilosis, literally, feathered hair, a name that is now applied to another disease. Beigel called it swelling and bursting of the hair, thinking it to be due to the formation of gas in the medulla. Wilson called it trichoclasis. It has also been called clastothrix. The German name "Besenhaare," or broom hairs, is very descriptive, and has the advantage of indicating no theory.

Trichorrhexis nodosa is a disease characterized by a loosening and breaking of the hair fibres at intervals along the shaft so that the hair at the points affected has the appearance of two little brushes, with their hairy ends stuck into one another; or, better still, it has the fibrillated appearance that a green branch gets when frequently bent at one point. It usually affects the hair in patches, and rarely occurs except in the mustache and beard; it has been observed, however, in the hair of the eyebrows, head, axillæ, and pubes. In fact, Paul Raymond [1] says it happens very frequently in the pubic hair, especially of fat women.

At a distance the hairs in the locality affected appear as if singed, but on looking more closely this is seen to be due to the frayed ends of the short, broken, stumpy hairs; then, examining still more attentively, grayish-white nodules will be found at irregular intervals along the hair shafts. These at first look like nits, but are more rounded, more regular, and involve the entire circumference of the hair shaft, instead of projecting from one side as nits do. Under the microscope the fracture and the fibrillation of the hair, the essentials of the disease, can easily be demonstrated. When an affected hair is pulled on, it of course easily breaks at the nodes. That part of the hair which is in the follicle itself, and the neighboring skin, are perfectly healthy.

Etiology.

It would appear that trichorrhexis nodosa is not a disease but a symptom that occurs under a great number of conditions, whenever the hair becomes particularly dry and brittle. In fact, in one of the first cases reported, that of Devergie [33] the woman's hair was dry and lustreless (*sec et terne*) owing apparently to physical rundown, and when the hair, with returning health, regained its normal suppleness and gloss, the trichorrhexis disappeared. Furthermore, this form of fracture is a constant accompaniment of monilethrix, where the hair is always dry, delicate, and brittle. In this view it can be seen why it should occur so frequently in the mustache and beard, from which the fat is daily removed by the use of water and soap. And besides the removal of the fat, these hairs are exposed to other injurious influences, such as the constant wiping away of particles of food, and the no less frequent twisting or tugging in absent-mindedness, embarrassment, or conceit. In addition to this, the hairs of the face are the thickest and stoutest of the body, and therefore bend less easily than finer ones. Their shape is also against them, for they are usually triangular instead of cylindrical, and the medulla is also three-cornered, and Giovannini finds that the fracture occurs principally in these triangular shaped hairs.[30]

It has been again and again supposed that trichorrhexis nodosa is a parasitic disease, and it is no wonder, for the scattered nodules in themselves look remarkably like parasites. In the ordinary variety of the disease, however, no parasite has been found that would stand the test of investigation. Paul Raymond [34] said he discovered in trichorrhexis nodosa of the pubes in women a bacterium that eroded the cuticle of the hair, and allowed it to fibrillate. I do not know of any investigation that has confirmed this. One would think that if a parasite were the causative factor, the disease would be much more frequent on the hair of the head than on that of the face, because when one enumerates both men and women—which it is perfectly fair to do—many more than double the number of people wear hair on their heads than on their faces. However, one must not be too positive that, at least in some cases, a parasite may not give rise to this condition, for Hodara, of Constantinople, has described a trichorrhexis nodosa occurring in the hair of women of that city that seems undoubtedly to be due to a bacillus—but of this further on.

Diagnosis.

The patient usually comes complaining of a parasite that destroys the hair, and takes the nodules to be nits. An examination with a low-power lens is sufficient to show that this is an error.

Lepothrix usually affects the axillary hairs, and it is readily seen that the nodules are masses of bacteria. The hair shaft is only slightly affected, the micro-organisms flaring out the cells of the cuticle, but causing very little fibrillation.

Piedra is very limited in its geographical distribution, and besides it is caused by the accumulation of parasites on the hair, the shaft itself being unaffected.

Besides trichorrhexis nodosa, monilethrix is the only nodular disease of the hair in which the nodules are the result of a histological change in the structure of the shaft itself.

Trichorrhexis nodosa may occur in a luxuriant growth of hair, usually among the coarser hairs, such as those of the beard or of the genital region. It is an acquired condition, that can appear and disappear, and heredity seems to play no part in it. In monilethrix the whole pilo-sebaceous system is affected, the disease is most marked on the scalp, the individual hairs are slender, the growth of hair is scanty, there is an accompanying keratosis pilaris, the condition manifests itself shortly after birth, and it is clearly hereditary. As for the lesion on the hair itself, in trichorrhexis nodosa the node is the diseased portion, in monilethrix the node represents the relatively normal portions of the hair. In trichorrhexis nodosa the medullary canal is lost at the nodes, but in monilethrix the medullary canal is present in the nodes. In trichorrhexis nodosa the hair breaks at the nodes when pulled on, while in monilethrix it breaks at the internodes. Trichorrhexis nodosa arises on the fully matured and perfect hair, in monilethrix the nodular condition shows itself in the hair follicle.

The diagnosis between ordinary trichorrhexis and that described by Hodara will be considered under the head of Hodara's disease.

Treatment.

When the trichorrhexis is owing to dryness and brittleness of the hair from physical rundown, with returning health there will be improvement or entire recovery. When the causes lie more with the anatomical shape and the exposed situation of the hair, as so frequently happens in the mustache and beard, then little can be done for it. Shaving kept up for a long time has been advised, and Schwimmer [11] has recommended the following ointment:

℞ Oxide of zinc, ... grs. vij.
Precipitated sulphur, ... grs. xv.
Simple ointment, ... ʒ iiss.
M. S. To be rubbed into the skin where the affected hairs are, morning and evening.

HODARA'S DISEASE.

Menahem Hodara has described a kind of trichorrhexis nodosa that he says is frequent among the women of Constantinople."

This affection may be defined as an infective disease of the hair shaft, resulting in the formation of trichorrhectic nodules and splitting of the hair into its ultimate fibres. The first symptom noticed is a splitting and breaking of the ends of the hairs of the head, so that they become shorter and shorter. The trichorrhectic nodules are too small to be felt, and can only be seen by examining the affected shaft very closely. The small, grayish-white nodules are best seen if the hairs are first cleared of the fine, white dandruff adhering to them, and then spread on a black surface. There are from one to three, rarely five or six, nodules on each diseased hair. The hair easily breaks at the affected place, forming an acute angle, with the white nodule at its apex. At these places the hair breaks easily on combing, on slight traction, or even falls apart spontaneously. The splitting takes place at the hair tip, and the shaft breaks up into two or three fibres. Sometimes the splitting is confined to the white nodules, but it may be much more extensive. The disease is situated on the distal portion of the hair, and creeps towards the scalp.

The malady has been observed only in the hair of the head of women. Hodara has never seen the disease in men, and furthermore says that the common trichorrhexis nodosa barbæ is a much rarer affection in Constantinople than in the west of Europe.

There was constantly present in the cases studied a small bacillus with slightly rounded ends. It was surrounded by a clear zone, and enclosed in a delicate capsule capable of receiving a stain. Cultures were made of the bacillus, and these cultures were rubbed into a young girl's hair, giving rise to an affection in every way identical with the original disease.

Hodara, having discovered the bacillus, has assumed sponsorial duties towards it, and has called it the Bacillus multiformis trichorrhexis.

The disease may last for years, interfering constantly and decidedly, not with the growth of the hair, but with its increase in length. This disease therefore differs from the ordinary trichorrhexis nodosa, as observed in western Europe and in America—

1. In the nodules being much smaller; 2. In all the nodules being situated towards the tip of the hair; 3. In its occurring most frequently in women, up to the present no instance having been observed in a man; 4. In being observed only in the hair of the head; and 5. In being accompanied by splitting of the hair.

The symptoms and treatment of onychia and paronychia fall under the head of general surgery.

A traumatism may cause permanent injury to the nail and interfere with the nail-producing function. The nail bed under such circumstances becomes covered with a tough, longitudinally striated, dirty, epithelial layer, instead of the normal, pink, glistening nail plate. I have seen one case where this result followed a longitudinal incision with a butcher knife, causing a depressed, striated furrow in the nail.

Unguis incarnatus, or ingrowing toe-nail, is a special kind of traumatism caused by the nail itself. The lateral edge, usually of the great toe-nail, grows down into its corresponding nail fold, giving rise to a painful ulcer. It is caused by wearing badly fitting foot gear; its symptoms and treatment will be found described in works on general surgery.

Onychophagia, or biting the nails, is most frequently met with in children, but occasionally in adults even of advanced age, and is an expression of nervousness.

Bérillon has tried to elevate onychophagia to the dignity of a disease, and says " that it is almost always associated with stigmata of degeneration. He finds that children who bite their nails are sickly, and present cranial deformities and anomalies of the teeth and ears.

There are many external influences that act on the nails, altering their structure or appearance. Pianists, from the constant hammering on the keys, often have broadened finger tips and short nails. Clock-makers, jewellers, bakers, and plasterers also have their nails changed by their occupations.

Many coloring matters are easily taken up by the nails. Every one knows how readily keratinized epithelium will take up an aniline dye, and how difficult it is to decolorize it. The dyer's hand is therefore naturally "subdued to what it works in." Artificial-flower makers have yellow nails, from the picric acid used.

Some substances when taken internally will color the nails. For instance indigo, when taken internally, will turn them blue, and the salts of silver give them a metallic slate color.

Discoloration of the Nails in Argyria.

The nails take on the peculiar metallic slate or brownish slate color produced in the integument by the prolonged ingestion of the nitrate, or any other salt of silver. The silver itself is deposited in the connective tissue of the nail bed, and not in the epithelium." No medication has been devised that modifies this condition in any way.

In almost all cases the diagnosis of argyria of the nails is easy, for, when the nail bed is stained, the silver has been taken internally, and the striking picture of the "blue man" will be present. But at times the terminal phalanges are the first parts affected, and in such cases the blue line on the gums must be looked for. This is a violet, instead of a grayish line as in lead poisoning, and according to Chaillon occurs very constantly and early. He found it in the second month, after 2 gm. of nitrate of silver had been taken.

Onychauxis.

Derivation.—Ὄνυξ, a nail, and αὔξησις, growth.

Synonym.—Onychogryphosis, less commonly but more correctly, onychogryposis (ὄνυξ, a nail, and γρύπωσις, a crooking, curving); hypertrophy of the nail.

The terms onychogryphosis and onychauxis are applied either to thickening and deformity of the nail plate itself or to the deformity and distortion caused by a heaping up of the epithelium of the nail bed under the nail plate.

The nail plate of the great toe often increases in thickness and hardness in old age, and if the person is bedridden, the nail may remain uncut and grow out into curves like a ram's horn, sometimes to over three inches in length. This is the form to which the term onychogryphosis is particularly applicable.

Simple growth in length cannot be called nail hypertrophy, as any nail may grow long if uncut and protected from attrition.

The nail deformity caused by a heaping up of epithelium under the nail plate, although it looks like nail hypertrophy, because the nail plate seems to be thickened, is really not an hypertrophy at all. A case of this kind, recently reported by Hallopeau and Le Damany " as an instance of generalized parakeratosis of the nails may be mentioned here.

The nails of all the digits were striated, both longitudinally and transversely, and thickened. The thickening was due to the presence of an incompletely keratinized layer between the nail plate and the nail bed, and one could see through the nail plate black longitudinal striations in this subungual layer. The process began on one of the thumb nails, and gradually extended to the others.

This patient had neither syphilis, eczema, nor psoriasis; there was no anomaly either of the nerve supply or of the vasomotor system, and ringworm and favus were excluded.

Small oval cocci in twos, somewhat longer cocci grouped in threes and fours, and very large irregular cocci colorable by Gram's method

were found in the incompletely keratinized subungual tissue. Cultures gave short and long bacilli divided off into sections by transverse septa. The disease not being reproduced by inoculation, it could not be maintained that the affection was caused by the parasites. Under the application of a solution of salicylic acid (1:20) the nails improved a great deal.

The retained epithelium under the nail plate in these cases may become very foul-smelling. In psoriasis, eczema, and pityriasis rubra pilaris the nails may become deformed, thickened, pitted, and uneven, and may receive the name onychauxis, or hypertrophy of the nail. In trophic disturbances of the ends of the digits, as in the chronic indurative neuritis of syphilis or leprosy, the terminal phalanges may undergo atrophy. The pulp of the finger tip also shrinks away, and the nail matrix falls over the tip of the finger. The nail growing from the matrix may then grow straight out from the finger tip as a thickened mass of horn.

The only treatment for onychauxis is the removal of the thickened nail by mechanical means. Besides using the knife, the file, and the saw, we can also soften the nail with an ointment of salicylic acid.

℞ Salicylic acid, ... grs. xxiv.–xlviij.
Simple ointment, ... ʒ i.
M. Sig. To be applied spread on lint.

After the superficial layers of the nails are softened with the preparation, they are scraped off, and the ointment is reapplied.

Onychatrophia.

Most of the atrophies of the nails are treated of under other headings, such as shedding of the nails in different diseases, crumbling and deformities of the nails accompanying other skin affections, such as eczema and psoriasis. Under leucopathia unguium increased porosity of the nails causing white spots, or even a crumbly consistence will be considered.

Winged Nail.

This condition was first described by Unna[4] as "the nail of passive congestion" (Stauungsnagel). It consists in the formation of a longitudinal ridge down the centre of the nail, which is caused by a tumefaction of the nail bed. This tumefaction may go on till the nail-bed rises up as a dark-red, smooth tumor which may divide the nail into two halves or wings. The condition may last for years, sometimes being better, then again growing worse, or it may entirely disappear.

Unna attributes the condition to chronic passive congestion of the

finger ends, and has seen it associated with emphysema, with general cyanosis, with chronic constipation, hemorrhoids, and hemorrhage from the kidneys, after frost bite of the hands and feet, and particularly well marked in a case of leprosy. The only time I have ever seen it was in a case of leprosy, the condition being brought to my notice by Dr. McGowan, of Los Angeles.

Affections of the Nails Accompanying Other Diseases of the Skin.

Frequently there is an alteration in the nails as one of the symptoms of a generalized skin disease. This is oftenest seen in psoriasis and eczema, but it may also occur in pityriasis rubra, erythema multiforme, exfoliative dermatitis, ichthyosis, and elephantiasis. For the particulars of the changes of the nails under such circumstances, the reader is referred to the articles on the different diseases mentioned.

Affections of the Nails in Diseases of the Nervous System.

The nervous system is the motor power of the living organism. It does not, however, preside over the general and special senses, over movement, and over the mental faculties only, but also over all the great functions. The most important of these functions is nutrition. There are disturbances of the nutrition of the nails caused by interference with this neurotrophic influence, and many of them are so striking and so important as to require consideration here, although they undoubtedly also will be mentioned under the head of the several diseases on which they are dependent.

These trophic disturbances of the nails manifest themselves in various ways. The nails may become thickened, clawed, cracked, and riffled, or, on the other hand, they grow thinner and show a tendency to split down into the quick, or to fall off entirely.

The Growth of the Nails in Paralysis.

Bernhardt and Weir Mitchell have both investigated the growth of nails in paralysis of the extremities. Weir Mitchell says he has not been able to determine exactly whether or not the growth of the nail stops completely immediately after the section of the nerves distributed to the fingers, but he has seen it retarded.

Bernhardt has found that no absolute rules can be laid down relative to the rate of nail growth in diseases of the peripheral nerves or of the brain, as cases apparently similar give, in this respect, different results. He does say, however, that nail growth is relatively independent of the influence of the nerves supplying the fingers and the nail bed.

Shedding of the Nails in Locomotor Ataxia.

In the course of progressive locomotor ataxia, and usually in an advanced stage of the disease, shedding of the nails sometimes occurs. Although this is not a frequent symptom, yet it occurs often enough to show that it is not a mere coincidence. Most of the instances have been preceded and accompanied by dull or tingling pain under the affected nail, and when the shedding occurred the pain ceased. In many cases subungual ecchymosis has been observed, the nail coming off apparently because of the damage so wrought. Under such circumstances the coagulated blood lies like a foreign body between the nail and the nail bed, stopping nutrition and causing exfoliation. Hemorrhage is, however, not always present, and the only explanation of the cases without hemorrhage seems to be a cessation of nail production from an interruption of trophic nerve influence.

It is astonishing with what regularity the great toe suffers in this affection. In all the cases collected by Bonieux " either one or both of the great toe-nails fell, the other nails being affected only occasionally. Most of these patients suffer from several attacks, some every year, some at irregular intervals. After each attack a perfect nail grows, and there are no inflammatory symptoms either preceding, accompanying, or following the affection. In some instances, at least, it appears to be a purely trophic nerve disturbance, and it has been found associated with other trophic lesions, such as rapid and painless loss of teeth, arthropathies, etc.

The shedding of one or more nails is an unimportant matter in itself, but as a symptom of a disease that is frequently so difficult to diagnose as tabes dorsalis, it becomes of much interest. In fact, it may be the one obvious feature that draws our attention to the true nature of a tabetic affection of the stomach, throat, or bladder. When suspicion is once aroused, it is usually easy by eliciting other symptoms to establish the diagnosis.

Affections of the Nails in Multiple Neuritis.

A number of trophic disturbances of the nails may occur in multiple neuritis. They may grow brittle and lose their lustre. Transverse riffles and inequalities may appear, or the nails may become stunted and fall off entirely. Whatever the deformity produced, it usually lasts a considerable time after the neuritis has subsided. In such cases there is no way of knowing what has caused the affection of the nails, the history being in most cases too inaccurate to permit of asserting the existence of a forerunning neuritis.

Besides the above-mentioned affections occurring in multiple neu-

ritis, Bielschowsky reports a case of transverse leucopathia unguium that will be spoken of under its proper heading.

In the trophic disturbances consequent on chronic neuritis, for instance in leprosy and syphilis, the nails may be twisted up into many fantastic shapes.

In the following three diseases, acromegaly, hypertrophic pulmonary osteo-arthropathy, and myxœdema, the nails become modified in their structure and in their shape. These three diseases are grouped together here because in all of them the hands become large and deformed.

The Nails in Acromegaly.

In acromegaly, as Byrom Bramwell says,[5] "the nails usually appear small in proportion to the size of the fingers; they are broad, flattened out transversely, and in most cases grooved in the longitudinal direction."

The Nails in Hypertrophic Pulmonary Osteo-Arthropathy.

Curving downwards of the finger-nails, with clubbing of the finger tips is observed in many cases of suppurative disease of the bronchial tubes, especially if the patient grows very thin, as in chronic pulmonary tuberculosis. Attention has lately been drawn by P. Marie to a modification of this deformity in a disease he calls hypertrophic pulmonary osteo-arthropathy. He says[6]: "The hands are truly enormous; I may even state that they are more striking in their size than those of acromegaly." Of the three segments of the hands—the fingers, the hand proper, and the wrist—the fingers, and especially the last phalanx, present the greatest changes, being swollen and bulbous. The nails are considerably widened, lengthened, and especially curved, so that the finger end, viewed sidewise, looks like the head of a parrot with its curved beak. This forms a decided contrast, and an important diagnostic feature, between this affection and acromegaly, where the finger tips are also enlarged, but where the nails appear too small for the large phalanges they cover.

The Nails in Myxœdema.

The nutrition of the nails in myxœdema is often affected so that they become dry, brittle, and easily break. The nails do not enlarge as in acromegaly and hypertrophic pulmonary osteo-arthropathy.

The Nails in Sclerodactylia, or Scleroderma of the Digits.

In sclerodactylia the nails become thin and grow small, till finally almost no indication of them remains.

As soon as attention is drawn to it, the diagnosis is easy, for by the time the nails are seriously affected the other symptoms of the disease are well marked.

The Nails in Syringomyelia.

In syringomyelia the nails are sometimes thickened, at other times thinned and friable. They are often striated longitudinally or transversely, rugous, and irregular. They sometimes fall spontaneously.

Trophic disturbances similar to those of syringomyelia occur in Morvan's disease, and in the chronic neuritis of leprosy and of syphilis. Under such circumstances the nail affection is accompanied by atrophy of the muscles of the hand, shortening of the bones (especially the phalanges), and sensory disturbances.

Shedding of the Nails in Epilepsy.

De Sanctis [11] has reported a case of spontaneous necrosis of all the nails of both hands after a severe epileptic attack. It could not be asserted that the affection of the nails was consequent on the "fit," but Meynert thought it might have been so. He threw out the suggestion that there might have been hemorrhages under the nails similar to those that occur in the conjunctivæ in epilepsy. It will be remembered that subungual hemorrhages also occur in some of the cases of tabes dorsalis.

Shedding of the nails also takes place in the universal or neurotic form of alopecia areata, and in hysteria.

Affections of the Nails in Syphilis.

Psoriasis, eczema, and syphilis are the diseases that most frequently give rise to dystrophies of the nails.

The primary sore of syphilis can be situated on the nail bed, causing the nail to be exfoliated. The thumb and index finger are the digits most frequently affected.

Mucous patches are more frequently found on the toes than on the fingers, and sometimes cause loss of the nail. In such cases the process is accompanied by symptoms of inflammation and the formation of pus. Usually, however, the shedding of the nails in secondary syphilis is unaccompanied by any such symptoms, and the nails simply fall off.

In tertiary syphilis there may be gummatous or ulcerative processes in the nail-bed, causing distortion or loss of the nail.

As a late symptom of syphilis the anterior part of several or all of the nails of the fingers and toes may become yellow and opaque. The nail plate loosens away from the nail bed and tilts up; it may then

become chalky, white, thickened, and friable, and its anterior half or two-thirds crumbles away. There is no hemorrhage nor any inflammatory symptom, and Unna" ascribes the whole process to a specific thickening of the grooves of the nail bed into which normally the corresponding tongues on the under surface of the nail plate fit.

Shedding of the Nails in Gonorrhœa.

Vidal" has described a case of gonorrhœa with shedding of the nails of the hands and feet. The patient, a man twenty-four years of age, had already had a blennorrhagia and soft chancres at the age of eighteen years. A short time after a second gonorrhœal infection, he began to suffer from a polyarthritis gonorrhœica, followed by an outbreak of an eruption of corneous crusts. The eruption was generalized and symmetrical, and consisted of hard, corneous, dry crusts without a trace of moisture. The lesions were small and disseminated upon the head, face, and trunk, and larger and more abundant on the extremities, especially the lower. The palmar and plantar surfaces were decidedly implicated, and the rash looked like a corneous syphilide in these situations. Many of the terminal phalanges of the digits were covered by these crusts, and the nails were lifted clear out of their bed. The patient had fever, and was anæmic, sleepless, and weak. In a little less than a year he had recovered entirely from the malady, and the nails had reappeared. Thirty-two months after the commencement of the second gonorrhœa he got a third infection that followed exactly the same course as the second; he had a similar rheumatism, a similar febrile movement, accompanied by anæmia and general debility, and a similar eruption, followed by shedding of the nails.

The second attack after such a long interval, and following exactly the same course as the first, showed plainly that it was not syphilitic, but gonorrhœal.

Scleronychia.

In this affection, described by Unna," all the nails of the fingers, and sometimes those of the toes also, become simultaneously thickened in their entirety, inelastic, hard, rough, and opaque, and have a grayish-yellow color. The longitudinal ridges may become more marked than normal, or the whole convex surface of the nail may become covered with little bumps and hollows. The malady may last for years, and causes a most unpleasant disfigurement of the hands. No constitutional cause has been discovered.

The disease disappears fairly promptly on the administration of arsenic.

Leucopathia Unguium.

Derivation.—Λευκός, white, and πάθος, disease.

Definition.—Leucopathia unguium is that condition in which white spots appear in the nails.

The appearance of a few spots is quite common; they are often looked upon as rather an ornament, and have received quite a number of pet names, such as "gift spots," "lies," etc. Where, however, they are very numerous, turn the entire nail white, or form remarkable figures, such as transverse bands, they constitute a mortifying deformity. Anatomically the lesion consists of a loosening up of the epithelial strata, resulting in the formation of minute interstices filled with air, that refract the light and give a milky effect instead of allowing the rays to pass directly through.

The cause of the error in the formation of the nail is sometimes apparent, but the way in which the cause acts to produce this structural defect is entirely unknown. It has been supposed to act through the nerves and to be of the nature of a trophic disturbance. Bielschowsky [1] reports a case of leucopathia of the nails following multiple neuritis where the relation was too close to admit of its being a mere coincidence, but it may have been simply a disturbance of nutrition of the nail-forming organ, due to the general inflammatory or febrile process, rather than to the inflammation of the nerves as such. We know that these bands do occur in the course of other febrile affections in which the nerves are not especially implicated (Vogel,[2] Morris Longstreth, and Langdon Down, quoted by Stout [3]), in which a simple lowering of the general health appears to bring it about. Cases of transverse striation of the nails also occur where the patients are apparently in the enjoyment of perfectly good health.

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BENIGN NEOPLASMS.

BY

JOHN T. BOWEN,

BOSTON.

BENIGN NEOPLASMS.

PAPILLOMA.

Of late years the tendency has been more and more towards limiting the use of the word papilloma as designating a distinct cutaneous affection, and at present the term is reserved for the description of a secondary change that is observed in a variety of skin diseases. It represents a tumor made up of greatly enlarged papillæ, and appears as a red, single or compound, lobulated growth, firm or soft in consistence, usually sensitive on pressure, and of a cauliflower form. Warty changes are also common upon the surface of these growths, which may be dry or exude a sticky secretion. As the papilla cannot be regarded as a distinct anatomical structure, in the same sense as are the blood-vessels or glands for example, papillomata are to be considered as circumscribed hypertrophies of the connective tissue, and as belonging among the fibromata. They are therefore conical outgrowths of the connective tissue of the corium, covered with proliferating epithelium, while the centre is traversed by a large dilated blood-vessel.

In most instances where these exuberant papillomatous tumors are met with, they are found to be secondary outgrowths from some chronic inflammatory affection, where the granulations have become hypertrophied and vegetating. Thus papillomatous lesions, with or without a decided hypertrophy of the horny layers of the epidermis, are met with in long-continued eczema and chronic ulcers of the lower leg, in sycosis, and in some bullous affections that have been loosely grouped together as pemphigus, and more frequently still in syphilis and tuberculosis of the skin. In the latter affection papillomatous new growth is often seen after ulceration, in the clinical form known as lupus papillaris, and also in the lesions of tuberculosis verrucosa cutis, so common on the hands of people who have dealt with animals or animal products, or who have infected themselves while caring for a tuberculous relative or patient. In frambœsia, or yaws, papillomata are a characteristic feature, and they are a very common phenomenon in leprosy and in mycosis fungoides.

Certain drugs may also cause very marked examples of papil-

or irritating secretions. They may often take on a rapid proliferation and end in true epithelioma. For this reason they should be promptly removed, especially if any signs of increased growth appear. They have been said to be very numerous sometimes in patients suffering from cancer, and Crocker has seen a large crop on the chest in an elderly woman who was suffering from acute eczema. From the fact that this form of verruca is often of a fatty consistence, some authors have wished to include it among the seborrhœas, and Unna has called it verruca seborrhoica. It is said to be accompanied often by seborrhœa oleosa.

Verruca Filiformis.—This name has been applied to the very small, thread-like growths, pointed at their free extremity, which are not uncommon on the eyelids, neck, and chest in people who have attained adult age. They are usually single, but may be multiple or grouped. They are said to be sometimes congenital, but in the large majority of cases they are acquired. In these filiform warts the papillæ do not seem to be distinctly involved, as the growth is made up of a projection of connective tissue from the lower layers of the skin, through the centre of which runs a blood-vessel. According to Robinson it resembles fibroma molluscum very closely.

Verruca Digitata.—In this form of wart there are numerous small, thread-like projections, which grow to a considerable height oftentimes, and which are separated from one another down to the base of the growth. They are of soft consistence, except at their apices, which are covered by a horny cap. Their chief seat is upon the scalp, but they may be seen also on the back and shoulders.

Warts have also been divided into *verrucæ acquisitæ*, acquired warts, as distinguished from *verrucæ congenitæ*. The verrucæ congenitæ often are arranged in lines or bands, which some have thought to point to the nervous system as in some way influencing their appearance. Others who oppose this theory have shown that they do not follow the nerve tracts. It is best to separate these congenital warty growths from the class of warts on account of their anatomical and clinical characteristics, and to consider them among the nævi of which they are a variety. *Verruca perstans* is a persistent wart which remains unchanged, while the *verruca caduca* falls off spontaneously after reaching a certain period of development. These divisions are of little practical importance, however.

In discussing the varieties of warts that are most commonly found in adult life, in distinction from youth and old age, Besnier says that all forms of warts may be found in adults, but that they are not so common, are more scattered, take on more irregular forms, and are very apt to be localized at the ends of the fingers in the periungual

fold, especially upon the thumb. This position makes them more annoying and more difficult to cure. The growths in the adult are more likely to be flat, diffuse, and horny, forming sometimes conglomerate plaques by confluence of the individual lesions (*papillomes cornés*). These appearances are found most frequently in workingmen, especially upon the backs of the fingers, over the articular prominences, upon the thighs, etc. They are undoubtedly brought about by the action of external irritants. They are very obstinate and tend to recur, and present a close analogy with verrucous tuberculosis. The plaques are often surrounded by an erythematous zone, and have an irregular granular surface, sometimes covered with fissures and ulcerations. When the horny covering is removed, the lesion is seen to be made up of an aggregation of papillary prominences which have assumed the most varied forms. These elevations are vascular, and their surface is always flat.

Verruca acuminata, or condyloma acuminatum, is also called moist or venereal wart, and is the *spitzes Condylom* of the Germans. These are soft, usually moist, papilliform excrescences, seated upon a normal, non-infiltrated base. They are made up of filiform, papillary projections, closely aggregated, and are either sessile or pedunculated. They are most commonly situated in the sulcus or upon the glans penis, on the labia and perineum, or about the anus. They are occasionally found about the mouth, between the toes, in the axillæ, or beneath the mammæ. When they are in the folds of the skin or where there is much moisture, they are covered with a yellowish, offensive secretion, and are likely to increase with great rapidity, assuming peculiar forms which have been likened to cauliflowers, mulberries, etc. When they are on a dry surface they are usually of the color of the normal skin, and are not covered with secretion. They may disappear spontaneously, although this happens less frequently than is the case with other varieties of warts. In pregnant women they are apt to take on a very rapid growth and then to disappear spontaneously after parturition.

Etiology.

Warts occur in people of all ages, although certain varieties are more common in childhood, while others are found chiefly in adults and in old people. The acuminate or moist form, which occurs especially in the folds of the skin and about the mucous orifices, is undoubtedly aggravated or produced by irritating discharges, especially those of gonorrhœa, with which it is most frequently associated. It is impossible to escape from the conviction that most forms of verruca are due to a contagion, although proof of this is still wanting. In

the case of the acuminate form just referred to, it is conceivable either that the germ is contained in the secretions which constantly moisten the part, or that these conditions offer a favorable opportunity for the growth of micro-organisms from some other source. Clinical experience affords many examples of the probably contagious nature of the ordinary wart that is met with chiefly in children, such as instances where several members of a family have developed these lesions soon after their appearance in one of their number. The results of experimental inoculation have not, however, been of a positive nature. Payne's personal experience is suggestive. This writer, after scraping away a wart with his thumb nail, developed a similar lesion under the same nail, and others appeared soon afterwards on the back of the thumb.

Several observers have found micro-organisms in warts, but no direct proof has yet been offered that they are pathogenic. Kühnemann found in sections stained by the Gram-Kühne method, a bacillus from 1 to 1.5 μ in length. These bodies were situated chiefly in the rete Malpighii, in and between the epithelial cells, and also to some extent in the lymphatic spaces. They were sometimes found in the horny layer and rarely in the adjacent tissue. They were less numerous in warts of older date than in those that had just made their appearance. They were stained a bright red by the Gram-Kühne method, while all other bacilli took on a deep blue stain. Cultures upon gelatin and agar-agar gave positive results that were identical in all the cases examined. Kühnemann's theory is that they enter the rete by means of some small fissure in the horny layer, and act as an irritant to the adjacent cells, causing them to proliferate. At the same time they modify the normal transformation of the rete cells into the granular and horny cells. After a time the bacilli do not find the conditions favorable for their existence, which explains their rarity in the older lesions. In this way the sudden disappearance of the growths may be explained. Inoculation of the cultures upon animals was said to have been followed by positive results in two instances.

Anatomically, warts are made up of a central prolongation of connective tissue, which contains a vascular loop and is covered by a thickened epidermis. All the layers of the epidermis are increased in size and the horny layer is in greater or less degree hypertrophied. It has been generally believed that these appearances are caused by an hypertrophy of the papillæ, combined with a greater or less thickening of the epidermis, which by its proliferation sends down projections between the papillæ and increases their length. Auspitz was the first to advance the theory that the papillæ do

not have an active function in this process, but that their change is due to the growth of the rete into the corium. Unna, in adopting this view, considered it strengthened by the fact that the normal papillæ are formed in fœtal life by the folding in of the epidermis, and not by the outgrowth of the corium. Kühnemann's studies led him also to the conclusion that the growth was purely an epithelial one, as the corium presented no changes except secondary vascular modifications. The proliferation and outgrowth of the rete is the first and primary change, which is followed by structural changes in the upper epidermal layers and modifications in the process of keratinization. The horny cells show changes in their form, and their nuclei are much more readily stained than under normal conditions. Verruca acuminata is separated from the ordinary wart by Unna, Kühnemann, and others, on the ground that we have here a simple growth of the rete unaccompanied by changes in keratinization. Furthermore, they do not consider, for similar reasons, that verruca plana belongs among the warts. Darier, from his examination of a case of the latter variety, comes to the conclusion that the elongation of the papillæ and the resulting increase in surface are sufficient to explain the hyperplasia of the epidermis.

Treatment.

A number of French physicians have recently stated that sulphate of magnesium, taken internally in the dose of from grs. ij. to v. for children and ʒ ss. for adults, will often cause the disappearance of warts, if the treatment is repeated for some days or weeks. Crocker was able to confirm this from several cases, although it was successful in by no means all. He states that a sufficient amount of magnesium should be taken to produce two or three free evacuations a day. Besnier states that he has tried this method in his hospital service, conscientiously and at different periods, but has never seen a single case that appeared to be influenced by it. The more limited experience of the writer accords fully with that of Besnier. Crocker has also found nitrohydrochloric acid in full doses of benefit in some cases. Arsenic has also been thought to have an influence on the growths.

It is to the local treatment that we turn with more hope of success, and the method varies greatly according to the nature and situation of the wart. In the case of the common warts, such as are seen especially in childhood, the various chemical caustics, such as nitric acid, glacial acetic acid, acid nitrate of mercury, etc., may be used with effect. They are to be applied by means of a pointed stick or a small glass rod, care being taken that no inflammation of the ad-

jacent normal tissues is produced. For this reason the surrounding parts should be protected by a layer of collodion, traumaticin, or other preparations that form a protecting pellicle upon the skin. In order to avoid too great destruction, it is wise not to attempt to remove the whole growth at one sitting, especially where the best cosmetic result is desired, but to run the risk of doing too little rather than too much.

Salicylic acid offers on the whole the best means of cure, on account of its well-known property of softening and removing the horny layers, without at the same time causing an irritation. It is by no means infallible, however, as some warts are but slightly, if at all, affected by it. Still, it is often of so great service that it should always be tried first, unless a speedy cure is demanded by the patient without regard to the cosmetic result, or unless the lesion is situated upon a portion of the body where a small mark is of little consequence. A common form of application is salicylic acid in flexible collodion in the strength of a drachm of salicylic acid to the ounce of collodion. This should be painted on the wart with a camel's-hair brush twice daily for two or three days without removing the pellicle. At the end of that time the wart should be carefully soaked in warm water and scrubbed with pumice or sand soap. This usually brings away a certain amount of the horny covering, when the wart is again treated in the same way, and so on till it has been all removed. Other ways of using salicylic acid are in the form of a saturated solution in alcohol, or it may be rubbed into a thick paste with glycerin, or used in the form of a plaster.

If this method fails, or is only partially successful, the various chemical acids mentioned above may be resorted to. The nitrate of silver stick may often be used with effect, especially after removal of the outer cornified part by salicylic acid or other methods. Caustic potash may be used in the same way, taking care to protect the surrounding parts from its inflammatory action. Other strong caustics need not be mentioned, as it is very doubtful if they have any superiority over those enumerated. Resorcin has sometimes proved effectual in the form of a saturated solution in alcohol or in collodion.

The acuminate form is sometimes exceedingly troublesome, especially if of considerable extent. When the growths are small, they may often be removed by simply keeping them dry and clean. For this purpose powders of boracic acid are of service, or powdered calomel often gives good results. If of larger extent, or if the above method fails, they should be curetted thoroughly, or snipped off with a pair of curved scissors, and the base should then be touched with

nitrate of silver or the actual cautery. In the case of still larger growths it may be necessary to use the knife.

Filiform warts are usually best treated by snipping off with the curved scissors and cauterizing the base. If objection is made to this method, they may be destroyed by passing the needle attached to the negative pole of the galvanic battery several times through their base with a current of from one to two milliampères.

Senile warts may be thoroughly curetted, and the base touched with nitrate of silver or other caustic. Less effective means are the various preparations of salicylic acid that have been enumerated, ointments and plasters of sapo viridis, etc.

In rebellious cases, of whatever variety, recourse may be had to the thermo- and electro-cautery. The electro-cautery may be used by applying the very fine points that have been devised by Besnier, the part having first been made insensible by a few drops of chloride of methyl. Electrolysis is to be recommended in certain cases, as when the wart is situated upon the face and it is important to obtain the best possible cosmetic result. The advantage of this method over all others is that we are better able to control the amount of destruction, and in this way to obtain the smallest possible resulting scar. The growth should be transfixed with the needle at several separate sittings, allowing a long enough interval to elapse between each to observe the effect of the previous treatment.

CICATRIX.

A cicatrix or scar is a new formation of usually dense and firm tissue which has developed at the point where there has been a loss of substance, due either to an injury to the skin and the adjacent tissues or to some pathological process. Cicatrices are often divided for convenience of description into three classes, according to their elevation, viz., *flat* or *normal* scars, which are situated at about the level of the normal skin; *atrophic* scars, which lie below the skin's level in the form of contracted, depressed areas; and *hypertrophic* scars which project above the surface. Hypertrophic scars may be elongated, rounded, star-shaped, with projecting processes, or they may be made up of ridges interlacing one another in the form of a network. Scars are as a rule smooth and glistening upon the surface, occasionally somewhat scaling and wrinkled, and vary in color from white to a more or less deep red, according to the amount of vascular supply. The more recent the scar formation the deeper the color as a rule. If the newly formed tissue is firmly bound down to the structures below, as periosteum and bone, the scar is fixed and immov-

able, in contradistinction to the movable scar which may be freely moved about over the parts beneath. The lines and furrows that are always seen on the normal skin, as well as the sweat and sebaceous glands and hair follicles, are not present in cicatrices. For the production of a cicatrix it is necessary that the corium, and especially the papillary layer of the corium, should be destroyed. Mere lesions of the epidermis, or inflammations that end in resolution and do not cause a destruction of the corium, are not followed by scars. Thus eczema, psoriasis, and dermatitis, from whatever cause, unless there be some accident or complication, do not produce scars, while lupus, many of the syphilides, epithelioma, and all processes involving deep suppuration leave scars behind them. It has even been said that skin diseases may be divided into two categories, according as they cause or do not cause scarring. Mechanical agencies such as scratching, wounding, etc., and chemical and thermal agencies, it hardly need be said, are frequently responsible for cicatrices.

In the process of healing after loss of tissue, either through mechanical agencies or from disease, a cavity is left after the necrotic portion has been cast off, and this cavity is gradually filled up from below by the formation of granulations. First there is formed a thin layer of coagulated blood, which fills up the inequalities of the surface and is collected about the edges. Next a thin, transparent varnish or film collects upon the entire surface of the wound or lesion, and to this the name "glazing" has been applied. The glazing does not take place until a number of hours have elapsed, and is due to the serum exuded from the blood-vessels and to the coagulation of its fibrin. Soon after, leucocytes begin to collect on the surface of the film in small spots, and a membranous covering is formed which is finally swept away by the formation of a layer of pus below, and bright-red small elevations, scattered over a surface of a similar color are brought into view. These elevations are the *granulations*, and the tissue that composes them is called granulation tissue. It is this tissue that fills up the cavity and takes the place of that which has been destroyed. This granulation tissue is found, under the microscope, to consist of small round cells or polynuclear leucocytes, and larger cells of the appearance of those found in epithelial structures, that have been called epithelioid cells. According to Warren the leucocytes abound near the surface of the granulations, while the larger epithelioid cells are found lower down, in the neighborhood of the blood-vessels. Lower still spindle-shaped cells are seen, while the lowest layers are made up of bundles of spindle cells, running in a horizontal direction. According to our present belief the fixed connective-tissue cells are the ones that bear the chief part in the formation of new tissue, to-

gether with the endothelial cells of the blood-vessels. It is from them that the epithelioid cells are produced, and later the fibrous tissue that composes the scar. The leucocytes have no active part in the tissue formation. Another feature of the granulations is the large number of small blood-vessels that they contain which have a generally vertical course towards the surface.

The new blood-vessels are formed from the walls of the previously existing vessels, by division of the endothelial cells, and the sending out of prolongations of protoplasm, that after a time become nucleated. These "buds," as they may be termed, may unite with similar ones or may become connected with other vessels. Soon the central part of the protoplasmic prolongation softens and a canal is produced.

After the epidermis has grown over the granulation tissue, the cell growth diminishes, the leucocytes are absorbed, the epithelioid cells have become converted into spindle cells, and a tissue consisting mainly of fibres with very few cells—the final scar tissue—makes its appearance. The epidermis which gradually grows over the surface of the granulation tissue in the process of repair is produced by a proliferation of the old epidermal cells at the edges of the lesion, the new epidermis extending gradually from the sides of the lesion until finally the whole surface is covered, the centre being the last place to be bridged over. Where islets of new epidermis appear independently at the centre, they may be ascribed to the proliferation of the epithelial elements of the remains of sebaceous and sweat glands, or to the wandering of the epithelial cells from the edges, as an amœboid motion of these cells has been affirmed.

Cicatrization may be faulty when the granulations develop poorly or unevenly, as occurs in persons of weakly constitution, or when pressure or uncleanliness, as in the presence of micro-organisms, exists. On the other hand the granulations may be too exuberant and project above the normal level of the skin (the condition that was formerly termed "proud flesh"), causing a delay in the formation of the epidermal covering.

The cicatrix when formed consists of a dense network of anastomosing connective-tissue fibres, abundantly supplied with vessels and nerves, but containing no sebaceous or sweat glands nor hair follicles. The papillæ of the corium are obliterated or are very feebly developed. A considerable amount of pigment is present in recent cicatrices which has been absorbed in those of longer duration. When blood-vessels are very numerous the cicatrix has a bright-red color, and the more recent the lesion the more numerous the vessels.

Some slight diagnostic significance may be claimed for the appearance or character of cicatrices, but this is very misleading and

possesses only a doubtful value. Certain scars resulting from the ravages of syphilis may at times present a somewhat typical appearance, but even here other processes or injuries may give rise to almost identical features. The serpiginous horse-shoe shape of some syphilitic cicatrices is well known but can hardly be taken into account as a factor in the differential diagnosis, or at the least but slight value can be attributed to this feature. The form of the scar, moreover, may be influenced by many factors that may be present during the process of healing, and altogether only a very slight diagnostic importance can be attributed to the appearance of the scar tissue. Often a probable diagnosis of zoster may be made, when groups of small scars are found following the course of a nerve upon one side of the body, but even here other destructive processes may leave in their wake the same appearances. The *locality* of the scar may be of some slight significance. Cicatrices upon the genital organs may furnish strong presumptive evidence in favor of preceding venereal disease, especially if they are found upon the exact localities that are apt to be affected in such troubles. So, too, contracted, wrinkled cicatrices over the site of lymphatic glands would suggest that tuberculous or so-called scrofulous lesions had preceded.

Considerable deformities are often produced by scars, besides those due to their appearance, solely in consequence of the traction that is exerted upon the surrounding skin and tissues. In this way the joints may become ankylosed or greatly deformed, or there may be cicatricial contraction about the mouth, nose, or ears, and the opening into the nasal passages may be completely occluded. Ectropion is a common result where the burn or other lesion has involved the eyelids. In extensive burns about the neck the contraction from the scar may cause the chin to be literally bound down upon the chest, producing great difficulty in mastication and deglutition.

Apart from the mechanical effects produced by their contraction, scars may become very sensitive and be the cause of great annoyance with certain people. Itching is another symptom sometimes complained of, and there may be also a disposition to inflammation. The cause of the sensitiveness may sometimes be found to be the presence of a nerve fibril that has been caught and bound down by the cicatricial tissue. Weir Mitchell considers it unusual to find scars pressing upon the nerves. He speaks of a case where a cicatrix existed very near the sciatic nerve, so that whenever the leg was straightened the patient suffered pain at the spot and lost power over the leg. At the time of the Civil War there were numerous cases of painful scars caused by gunshot wounds, especially superficial shell wounds. He thought that some such alteration probably existed in the nerves as

has been described by Danielson and Boeck as occurring in nerve leprosy, where there is at first a congestion of the neurilemma, and later a hyperplasia of the connective tissue both without and within the nerve sheath.

Warren has had a series of cases of persistent headache in young persons following scalp wounds. After other treatment had been tried the pain was relieved by excision of the cicatrix. In the first case the injury was a scalp wound caused by a blow from a horse's hoof. A year later there were persistent headaches which incapacitated the boy for work or play. The pain was most marked at the site of the cicatrix, which was excised, and the bone, which was found to have some indentations, was trephined. Several large nerve trunks, some normal, others atrophied, were found in the cicatrix. The symptoms disappeared soon after the operation. In a second case a boy of eleven received a scalp wound in the right frontal region. He began to have headaches two or three years later. Relief was obtained by excision of the scar, in which a comparatively large nerve fibre, with its fibrillæ separated by the fibrous tissue of the cicatrix, was found. The third case was that of a woman, twenty years of age, who was kicked by a horse in the right temporal region. The persistent headaches that followed were completely relieved by excision of the cicatrix, in which a nerve trunk considerably altered was found. In these cases there was not only found to be pressure existing, but more or less extensive alteration of the nerves, some showing an interstitial neuritis, which was evidently the chief source of the pain.

It is only rarely that scars disappear entirely, although this sometimes happens in those acquired in early childhood. They usually grow in proportion to the growth of the body. It has been remarked that this rate of growth is not sufficiently known to surgeons, nor taken into account by them when considering the propriety of operations in children upon parts that are exposed to view, as it is generally thought that they either remain stationary or diminish. It is only the scars from some slight wounds that really diminish to any extent. Paget has said that a scar that a child might have said was as long as his forefinger will be still of the size of his forefinger when he has grown to be a man. The scars that are formed in early operations, as in harelip, show, according to Warren, greater deformity as the individual grows. It may be mentioned as a curiosity that a certain locomotion in scars has been said to occur. Panas tells of a case where a small scar near the eyelid in an infant gradually rose until it was near the roots of the hair.

Apart from the effects of injudicious treatment of a wound or lesion, and of mechanical irritation during the process of repair, a cer-

tain predisposition to the formation of scars exists in certain races and in certain individuals. The negro race is proverbially prone to the development of scars, and in them we see the most pronounced examples of hypertrophied scars and of keloidal growths. Certain individuals of the white races possess this idiosyncrasy also. In some a very slight wound, or an acne pustule, will leave a scar quite out of proportion to the original lesion. The operation of electrolysis for the removal of superfluous hair—which, if properly performed, leaves in the vast majority of people no permanent trace upon the skin—causes in a certain small number a slight cicatricial pitting, dependent not on the lack of care with which the operation has been performed, but upon the subject's idiosyncrasy.

The association of cancer with cicatrices has been pointed out for many years, and the literature of the subject contains many instances of this disease developing upon a preëxistent cicatrix. It has been said that this is more likely to occur in scars produced by blistering and cauterization, although this statement seems to lack convincing proof. It is most commonly observed in people of middle age, and in cases where the scar has been exposed to irritation for a long period of time. It occurs as a rule after the cicatrix has existed for a considerable number of years, and progresses slowly, the scar sometimes becoming ulcerated and again healing several times before the typical growth asserts itself. It occurs in two principal forms: in the first, small warty tubercles appear, and increase by confluence with similar tubercles in their vicinity, the so-called papillary form; the second is the ulcerating form, of a granular or fibrous appearance, which spreads by the appearance of cancerous tissue in the parts adjacent. It has been said that the development of cancer in cicatrices is nearly three times as frequent upon the lower as upon the upper extremity, which is not surprising in view of the great frequency of ulcers upon the latter parts, their exposure to injury and irritation, and their obstinacy in healing. Cancer has also been observed in the cicatrices of syphilis and tuberculosis. According to Warren these cancers in scars of the lower extremities are characterized in some instances by large epithelial cells and belong to the polymorphous type of epithelioma, while others are much like rodent ulcer or small-celled epithelioma. They are of a low grade of malignancy, and there is rarely any implication of the glands.

Treatment.

Great care should be taken in the management of wounds and pathological lesions, especially when they are situated upon exposed portions of the body, in order to obtain after the process of repair is

complete as small a scar as possible, of a thin, smooth, and movable character. In the treatment of wounds much depends upon the care with which the edges are approximated, for there is a tendency for the epidermis of one edge to bury itself into the deeper tisues, thus causing an increased amount of granulation and favoring the formation of an hypertrophied scar. Very superficial stitches are recommended by Warren. Lassar has claimed that we may avoid disfiguring scars when there is much loss of substance, by remembering that the skin has a greater power of regeneration than it is usually credited with. He advises that when the thin layer of epithelium has pushed out over the granulations, the dressing should be removed every few days and this epithelial layer scraped off, at the same time the borders being stimulated with a knife or curette. In this way he thinks that the normal epidermis and corium will cover a larger part of the wound and that the resulting scar will be of smaller size. Great attention should be paid to cleanliness and asepsis, and all obstructions to the circulation of the part should be removed as far as possible. Exuberant granulations must be checked, and this may be accomplished by cauterization with the solid stick of nitrate of silver, or with ointments of nitrate of silver, acetate of copper, etc. Some have favored curetting. For torpid granulating surfaces the value of iodoform is well known.

If the scar projects, compression is often of value, and will sometimes remove the redness as well. For this purpose nicely adjusted strips of mercurial plaster, or a five-per-cent. salicylic acid soap plaster, worn first at night and later continuously, have proved of benefit; care should of course be taken that no irritation be caused by these plasters. For depressed scars of the face Unna has recommended friction with sand so as to counteract the excessive accumulation of the horny epidermal layer. In this way the scars from acne pustules, and also those from a case of small-pox, were decreased. Powdered marble, either alone or mixed with soap, sulphur, etc., is also recommended; the scars are to be rubbed with a fine sponge dipped in the powder for ten or fifteen minutes twice a day.

The pigmentation of a scar may often be much reduced by the employment of the remedies just mentioned. When grains of powder are embedded in the skin, rubbing the parts with a nail brush immediately after the injury, while the patient is anæsthetized, is often successful. The grains may also be removed without a scar by the cutaneous punch, as recommended by Mixter.

When a large surface has been denuded and the wound does not show signs of rapid closing in, skin-grafting is resorted to. Of the methods of skin-grafting, that of Reverdin is the oldest, and consists in cutting small bits of skin from another part of the patient's body,

or from that of another person, dividing them into very small pieces, from 5 to 10 mm. in size, laying them on the granulating surface at a short distance from one another and securing them in place by means of adhesive plaster. After five or six days the plaster is removed, when, if the grafting be successful some of the pieces will be found to be firmly adherent. This operation has, however, of late years been almost entirely superseded by that of Thiersch, the principle of which is the transplantation of much larger and thinner pieces of skin. The granulating surface is first refreshed by curetting, or by shaving with a knife. The parts are then washed with boiled water or with a sterilized salt solution (six-tenths of one per cent.). Then with a broad, flat knife thin strips of skin are removed from some other part of the patient's body, the thigh being the place commonly chosen. These strips or shavings of skin are about one inch wide and from two to six inches long. They are laid on the surface of the ulcer so that their edges slightly overlap one another, and they should extend also a short distance from the edge of the wound. Thin strips of rubber or gutta-percha tissue are then laid over the grafts, and the whole is covered with an aseptic dressing, which should be renewed in three days. If the grafts have taken, they will present a slightly pinkish tint. Care must be taken with the rubber covering as the grafts are injured by too much maceration. In cases of small losses of tissue, this operation may be done under cocaine anæsthesia.

For the prevention of scarring from small-pox, protection from the light and air is of great importance, and to this end masks for the face may be used, spread thickly with some soothing ointment or paste, or a zinc paste may be simply smeared over the integument.

Keloid.

Keloid (less commonly, but more correctly, written cheloid, derived from χηλή, a claw) is the name usually applied to a scar-like, fibrous tumor, generally without inflammatory symptoms, that develops in the skin and can only be moved with it. It was formerly customary (and is still with some authors) to consider keloid in its true sense a tumor that appears spontaneously and not at the site of an injury to the skin. Hence a division was made into true keloid and false keloid, the latter a fibrous growth proceeding from an injury, and differing from an hypertrophied scar only in the fact that it greatly exceeded in extent the area of the original loss of substance.

The disease was originally described by Alibert, and has no relation to Addison's keloid, which is the form of scleroderma called

morphœa. Many authorities at the present day are much inclined to doubt the necessity of separating the true from the false keloid. The chief distinction that has been claimed is that the true keloid is a spontaneous growth, while the false keloid must have been preceded by an injury at its point of beginning. When one takes into consideration the rarity of true keloid (which is said by Hebra and McCall Anderson to occur once in two thousand cases of skin disease), and the fact that a slight injury and a minute scar caused perhaps by simple pressure of the clothing, or rubbing, may be very readily overlooked, the probability that these growths have the same etiology is a near one.

A true keloid may be a single growth or there may be a great many present; is usually situated on the sternal region, where if multiple the lesions are often arranged in parallel rows. Other parts upon which it has been met with are the face, ears, back, shoulders, breasts, etc. It appears as an elevated, sharply bounded, firm, and elastic tumor or ridge, projecting from 2 to 4 mm. above the skin's level. Sometimes it is flattened, or cake-shaped, at other times rounded. It is usually of a glistening white or red color, very smooth upon the surface, usually without any hairs, and often painful on pressure. When situated upon the chest, it extends transversely across it and is apt to terminate in claw-like processes. This latter feature is also common to it when in other situations. Little is known as to the mode of development of the true keloid. It usually progresses up to a certain point, where it remains unchanged for life, or in rare instances it may disappear spontaneously. Crocker mentions a case of a gentleman of sixty-seven who had a large number of scar keloids on his body dating from boyhood, having followed a crop of boils. These were the seat of itching and stinging at times, especially after stimulants had been taken. In this case three of these tumors disappeared spontaneously, leaving a loose fold or sac of skin where they had been present. Crocker also mentions two other cases in which small scar keloids developed and disappeared under observation. Hutchinson believes that involution is the rule in the keloid of young people, while in older people the diminution is very slow or does not take place at all. Wilson has reported a case where the tumor varied according to the health of the patient. There is no ulceration; either sex may be affected, and it may appear at any time of life. De Amicis relates a case in which three hundred and eighteen lesions were present, scattered over the body, and most of these were spontaneous, and symmetrically arranged.

False or *scar keloid* may appear anywhere on the body, although scars upon the chest are more apt to form keloidal growths than those

elsewhere, for some obscure reason. Certain individuals are predisposed to keloidal scars, and a very slight wound or loss of tissue will give rise to these tumors. It is also characteristic of some families, and, as stated above, the negro race possesses a marked idiosyncrasy for scarring and for keloid. Many of the most marked examples of keloid are seen in this race. It is not uncommon to see negroes with large numbers of these growths scattered over the body, some of which have attained a large size and cause great deformity. In some of these cases it has seemed impossible to the writer—so great is the number of the lesions—that they have all followed an injury *in loco*, and were not to some extent spontaneous. Occasionally small lesions, such as acne pustules and the lesions of small-pox, may give rise to keloid. The lobe of the ear which has been pierced for earrings is a not uncommon site of keloid, which may here cause much disfigurement. Leech bites are also a cause. It has been said that keloid is particularly common in syphilitic scars, where it is softer and is more likely to undergo involution. A case of syphilis has been reported where the whole body was covered with keloidal growths, which disappeared under the use of iodide of potassium; but this must certainly be a very exceptional occurrence, and the influence of the iodide upon the growths has not been established. False keloid after growing to a certain size ordinarily remains stationary, or may flatten somewhat and become paler. Exceptionally it may grow to an abnormal size, as in a case reported by Hayes where a keloidal tumor weighed eighteen pounds. This occurred in a male negro, thirty-six years of age, who had first noticed the growth sixteen years before. It was situated at the level of the eighth dorsal spine, and had begun to grow three years previously. When removed it covered the whole back. A competent pathologist who examined it microscopically pronounced it a hard fibroma.

False keloid is especially apt to develop from scars caused by burns, caustics, or even blisters. Many of the severe cases of multiple keloid seen in the negro race start from burns. Hutchinson reports a case of a negro who had been severely burned on the neck and chest from boiling water. At the site of the burn a large keloid had developed that hung like a collar over his left shoulder. This case illustrated well the predisposition of this race and of this individual to keloid, as there were many old scars on his arms from bleeding and cupping, and one on his forehead from an injury received just before the scalding. When the scar caused by the scald began to take on a keloidal character, many of his other scars began to grow in like manner, some very slightly, others to a marked extent. Hutchinson thought from this that the keloid had in some way caused an infec-

tion which had the power of forming only scar tissue. The theory of an infection in these cases seems hardly probable; but it may be that the cases of apparently spontaneous keloid appearing in numerous places over the body at the same time with or soon after the development of a false keloid from an injury or other lesion, are to be explained in this way, viz., that a predisposition to keloidal growth is set up by the first formation, and this excites the growth of previously existing minute or perhaps microscopical scars.

Keloid in plaques has been described by Taylor and Hutchinson. Here there is a sharply bounded, firm plate of fibrous tissue, deeply set in the skin and not projecting. In places it may be adherent to the epidermis, which is pale and smooth. In two cases the keloid did not recur after removal. Keloid of the mucous membrane has been described, but must be very rare. Verneuil has reported a case of keloid of the conjunctiva.

Anatomy.

Under the microscope sections of keloid show a dense, firm, fibrous mass of tissue, the fibres running parallel to the long axis of the tumor. In some places the fibres running horizontally are crossed by vertical ones. Where the growth is an old one the bundles of fibres are very closely packed together. There are a few nuclei and spindle cells in the tumor, and these are found chiefly about the vessels. According to Warren, blood-vessels are found running parallel to the fibres and surrounded by spindle cells, and as we trace these vessels still farther into the normal skin a cell growth is found in the adventitia extending a considerable distance beyond the periphery of the tumor. The changes in the adventitia are best seen in the vessels at each end of the growth between the papillæ, where the walls of the arteries are quite surrounded by cells, while there are none about the veins. The development of the keloid probably takes place from a growth of the adventitia of the arterioles, which are transformed into fusiform cells and finally into fibres. These bundles of fibres arising around the arteries gradually compress the tissue of the corium, and the bundles thus formed are united into the keloidal growth. The changes in the walls of the blood-vessels for some distance beyond the edge of the keloidal growth probably account for the tendency to recur.

A distinguishing point between true and false keloid has been supposed to be the persistence of the papillæ in the true variety, while in the false they have been obliterated. A considerable number of cases of true keloid have been examined, however, where the papillæ were wanting, as in the cases of Babes and Winiwarter, and of Warren,

where this was considered to be due to pressure. Although the existence of papillæ in true keloid, therefore, is the rule, it has been abundantly shown that this does not always follow, and the belief is spreading nowadays that the true keloid also probably has its beginning from a minute scar that has escaped notice. It is quite probable that serial sections through these tumors, which have doubtless been practised rarely, would show the papillæ wanting at some point near the centre of the mass. Crocker relates a case examined by him, of a keloid arising from a cicatrix, where the papillæ and rete cones were absent over a part of the tumor but not over all, their presence or absence depending upon the depth of the tumor in the corium. Unna also acquiesces in the view that keloidal growths and cicatrices present in some parts papillæ, and considers that every case should be studied by itself. Upon the whole there seems no reason for separating the true from the false keloid on histological grounds. Unna considers that true keloid is usually produced by scratching the lesions of eczema seborrhœicum so common upon the front of the chest, the favorite seat of true keloid.

It has been suggested that the origin of these growths from the walls of the arteries and the presence of spindle cells in such quantities point to the possibility that muscular tissue is in some way active in their production. This would account for the great power of contraction of these growths. Warren has pointed out that it is in the races prone to uterine fibroids that keloid is most common. He thinks that it may be that the media of the artery is also involved in the pathological change, and that there is really a growth of myomatous tissue.

Diagnosis.

There is rarely much difficulty in distinguishing keloid. When it occurs upon the chest, with its raised, glistening surface from which project the claw-like processes, it is hardly possible to mistake it for anything else. The distinction between an hypertrophied scar and a keloid is that the former does not overstep the limits of the original injury or loss of tissue, while the latter does. The histological difference cannot be relied on. As has been seen from the above, it is very questionable whether the true or spontaneous keloids have any right to be separated from the false. A possible confusion might exist between a keloid and a deep syphilitic gumma, or a tuberculous process, when complicated, as these lesions sometimes are, by an increased fibrous growth; yet a more careful examination would almost inevitably clear up the diagnosis, as some of the other distinctive features of tuberculosis or syphilis would be pretty sure to be present.

Lymphadenoma and sarcoma may be mentioned as in some instances similar in appearance, and also fibroma in which the resemblance is more apparent still. The situation of the growth in the favorite locations for keloid, especially on the sternum, the lobes of the ears, etc., may be of assistance in its differentiation from other processes.

Prognosis.

As has been stated above, spontaneous involution occurs exceptionally, although some believe that it is not so rare as has been assumed. This is more common in young subjects where there is an undoubted traumatic origin, and according to some is seen more frequently in pathological processes in which the lesion was caused by syphilis. Ordinarily the tumor is progressive in its growth up to a certain point, when it ceases to increase and remains stationary for an indefinite period.

Treatment.

Nothing very favorable can be said as to treatment. If the growth is removed by excision or cauterization it is almost sure to return, owing probably, as has been said, to the implication of the vessels outside of the affected area. If excision is attempted, as much of the normal tissue beyond the boundaries of the growth as possible should be removed, so as to eradicate as many of the outlying vessels as is practicable. When the tumor is very painful injections of morphine or cocaine may be resorted to. The physician is frequently consulted, not with a view to a removal of the growth, but for the relief of the pain and itching. Mercurial plaster to cover the growth continually may be applied, and should be so adjusted that the good effects from an even pressure may be combined with the possible absorbent action of the drug. Compression is of undoubted advantage in many cases, but should be made in such a way as to avoid friction. The elastic bandage has been recommended by Verneuil, who has seen the growths disappear under this method. Other methods of obtaining compression are by the use of mercurial ointment spread upon linen and applied to the growth, this being held in place by circular strips of adhesive plaster, and by collodion freely applied outside of this dressing; it should be renewed at the end of a week. A salicylated soap plaster cut into small strips and carefully strapped about the tumor will sometimes cause it to diminish or even to disappear. Ointments of iodide of lead and of resorcin have been claimed to act with good effect. Internal remedies given with a view to promote absorption of the growth have been found of little value.

Quadrilateral linear scarifications, employed according to Vidal's method, have been followed by a measure of success in the hands of various operators. They should be made about once a week, and the distance of the separate incisions from one another should be graduated according to the thickness of the growth; for instance, in a keloid from 5 to 6 mm. in thickness they should be at a distance of from 3 to 4 mm. apart. They should be deep enough to divide the whole tumor and be arranged so as to form squares by their intersection. According as the tumor diminishes in thickness the incisions should be approximated to one another. It has been advised also to call in the aid of mercurial plaster to be worn between the times of scarification. This method has, chiefly in the hands of the French, proved of great service in mitigating the pains that are so frequent an accompaniment of this affection.

Electrolysis was suggested by Hardaway, the introducer of this method for the destruction of superfluous hair, who had observed in a case of hypertrichosis, where a large number of hypertrophied scars had been produced by the injection of caustics into and about the follicles, that these scars were made to disappear when the electrolytic process was employed for the hypertrichosis. He employed the method of transfixing the base a number of times with the electric needles. Brocq has reported good results in several cases from the use of this method. He advises the employment of a current of from five to ten milliampères for from thirty to forty seconds, the needle being introduced in various places until the whole growth has been influenced by the electrolytic action. The pain caused by this procedure is considerable. Another application is made when the effects of the first one have disappeared—on an average, about once in ten days. After a certain time it is wise to suspend treatment for several weeks. The effect of the electrolysis seems to continue for some months after the sittings have been discontinued. If the séances are discontinued before the stage of complete cure has been attained, the growth will show a tendency to regain its former dimensions. A proof that this method has not given uniformly good results alone, is the recommendation to combine it with scarification and the application of mercurial plaster. Linear scarifications are first performed, using the mercurial plaster in the intervals between the operations. After the scarifications have been continued for several weeks, the good effects will probably become less marked; then several sittings of electrolysis may be had while continuing the plaster. When the electrolysis has begun to lose its effect, the scarifications should be renewed. While the published results from these procedures have not thus far been especially encouraging, the obstinacy of these

growths to treatment by excision and other methods should be remembered, and the good effects occasionally observed from scarification and electrolysis should be accorded their due weight.

Compression obtained by firmly adjusted strips of mercurial or salicylated soap plaster is to be especially recommended before other means have been tried, as it will sometimes produce marked results.

FIBROMA.

Fibromata of the skin are tumors due to a hyperplasia of the connective tissue, of which the fibrous portion is most developed, with very slight participation of the cellular elements. The corium, although composed for the most part of fibrous connective tissue, has very little tendency to produce fibromatous neoplasms, and pure fibromata of the skin are of rather rare occurrence, if we consider fibroma molluscum as a neurofibroma. A simple fibroma of the skin may be characterized as a hard tumor, usually single, which appears upon the trunk or extremities, either sharply defined or merging gradually into the normal tissue, but without projecting spurs or claws, as is frequently the case in keloid. Histologically, as well as clinically, there is both a diffuse and a circumscribed variety. In the former there is a diffuse hyperplasia of the fibrous connective tissue of the corium, which is massed about the follicles, glands, and vessels. The epithelial structures are not affected. In the circumscribed variety there is a sharp demarcation between the tumor and the normal tissues. The tumor usually projects above the surface of the skin and is movable with it. The follicular structures are pressed aside by the growth, and the sweat glands are thin and atrophic. There is no elastic tissue in the growth, or only some scattered remnants. The tumor is composed of large bundles of connective tissue, interlacing and intersecting one another in all possible ways, and differs from the diffuse form in the hypertrophy of the individual bundles of fibrous tissue which attain a very large size.

Fibroma Molluscum.

This affection, which is usually described under the fibromata although its histology has not been wholly agreed upon, has also been called molluscum fibrosum, molluscum simplex, and molluscum pendulum. Just what is the origin of the word molluscum is a matter of doubt. The name was given to the affection by Bateman, without explaining his conception of its etymology.

Fibroma molluscum is characterized by the presence of multiple

tumors very variable in size. Sometimes there is a slight prominence, of the size of a pea, which can hardly be seen, and which is betrayed more by a slight discoloration or blueness of the skin than anything else, but which can be distinctly felt, when the finger is passed over it, either as a moderately firm nodule or as a sort of pouch into which the outer skin may be compressed. Others are distinctly raised and stand forth prominently on the skin, and may be as large as walnuts or as eggs, in some instances attaining still greater dimensions, so that tumors the size of a child's head have been recorded. As a rough average they may be said to be of the size of a walnut. In shape they are round, pear-shaped, or oval and they are rather deeply embedded in the skin. The color of the tumor may be that of the normal skin, or pinkish, or quite red according to the amount and nature of the compression that is exercised on the capillaries of the upper layers of the skin. The larger tumors are more likely to have a deep color. The skin over them is either tense or loose, so that it may hang down in folds. These growths are almost always multiple, but here too there is a great variation, as their number may vary from three or four up to thousands. Cases have been depicted in which almost every square inch of the body was covered by the fibrous growths. The trunk is the part most frequently affected, and the front more commonly than the back, the sides being comparatively free. The head and limbs come next in frequency, but there are rarely many on the latter parts, and they are seldom seen on the palms or soles. The mucous membranes have been affected in some cases.

Taylor has had an opportunity of watching the development of the growths in a young person over a period of many years. As it is not often that an observer is able to study the development in this way, his descriptions are of much value. He says the first stage is a slight uplifting of the skin in a round spot of an area of a quarter of an inch or less. These spots are at first light pink in color, many of them attaining a rosy hue later. At this early stage the tumor is soft to the touch, and is much more easily depressed than the rest of the skin, and gives the impression of a thinning of the corium. If the finger is placed directly over one of these spots the skin can be gradually pressed downwards, giving the sensation of an empty space beneath. This thinning of the corium continues from the time of the earliest appearance of the tumors until they reach the size of a nutmeg or larger. When the tumors have reached a diameter of about an inch they have assumed either a round or an oval shape according to the direction of the bundles of subcutaneous connective tissue; they are round upon the back, oval on the sides of the body, their axis

showing a tendency to follow the line of the ribs. When they have attained an area of an inch they may remain stationary for a long time, or may increase in size and become hard and firm. Some of these may gradually become smaller, and their place be taken by warty growths or empty pouches of skin. After the growth has reached a certain size, it may become broader at the base and remain a sessile tumor, or it may become pedunculated by the protruded portion growing faster than the base. If the former continues to grow we may have later a pendulous tumor which the old writers called molluscum pendulum. The tumor may grow by itself or coalesce with other tumors and in this way the condition of dermatolysis is reached.

As a rule the soft and gelatinous tumors are the ones found in early life, and they may take on a rapid growth, or they may undergo involution. In older patients the tumors grow more slowly, are more dense and firm, and are much less liable to undergo involution. When undergoing involution the tumor gradually becomes more and more pedunculated, the skin apparently tightening around the mouth of the pouch, and invagination of the tumor is more difficult. The new formation, which, when the period of development is well marked, is firmly attached to the skin, becomes gradually separated from it, so that the overlying skin can be easily pinched over the tumor. The neoplasm then slowly diminishes until finally only a fibrous cord contained in a flabby mass of skin can be felt, and at the same time the cutaneous covering and the ring of skin at the base become flaccid and wrinkled. This leaves a warty or purse-like outgrowth from the skin, which in some cases may be pulled out to a considerable distance. In other instances a very small pea-sized warty growth may be left. The rate of development of these tumors varies much in different cases, and in different tumors in the same case. The older the patient the slower is the growth or involution of the tumors. They may be very annoying to the patient on account of their number and size in well-marked cases, and they may also impede the movements of the joints when situated near them, or they may obstruct vision when seated upon the eyelid. Very large tumors may cause great tension, and severe inflammation may be excited.

A difference of opinion has long existed as to the mode of origin of these tumors. Rokitansky thought that the fibrous growth started from the deep intercellular spaces of the corium; others that the point of origin was the connective tissue around the hair follicles and sebaceous glands. Virchow's view was that the connective tissue of the fat was the starting-point. Von Recklinghausen's observations went to prove that the growth was in reality a neurofibroma, the

connective tissue being of a different kind from that of the cutis, and growing from the subcutaneous nerve branches upwards into the skin, surrounding the blood-vessels, muscles, and follicles, and breaking up into finer bundles in the neighborhood of the upper layers. This view has received many adherents, notably Unna, whose observations were confirmatory of von Recklinghausen's. He says that the subcutaneous nodules show an evident plexiform arrangement, consisting of strands of finely fibrous transparent connective tissue, rich in cells, which are held together by ordinary loose connective tissue. Medullated and non-medullated nerve fibres penetrate the new formation, usually widely separated from one another. As the growth becomes larger, the normal connective tissue of the sweat glands and follicles, and that about the vessels, disappears more and more, to give place to the transparent neurofibrous tissue. The epithelium suffers but little. Several nodules that have not yet run together, are often found in the corium at the same time that the subcutaneous nodule makes its appearance. In these nodules in the corium the plexiform character of the new growth may be well studied. The upper layers of the skin are only exceptionally fully invaded by the new growth. The papillæ are rarely implicated. The nerve fibres themselves are neither increased nor diminished. The blood- and lymph-vessels in the tumor are on an average much wider than in normal skin, and the lymph spaces are wide and gaping. There is no emigration of leucocytes. The neurofibrous connective tissue in the larger nodules is a yellowish-gray, transparent mass, sharply bounded from the surrounding skin. This tissue is not as a rule easily stained, and has not a fibrillary appearance like the normal fibrous tissue of the corium. The neoplasm contains a conspicuous number of "mast" cells which are pretty regularly distributed throughout its area. Unna considers that there is a widely distributed myxomatous change in the connective-tissue cells, which is peculiar to the neurofibroma and is to be taken into account in the differential diagnosis. The theory of von Recklinghausen seems on the whole to be best supported by the histological appearances.

The advanced forms of fibroma molluscum may offer appearances very different from those of the ordinary multiple tumors that have been described. The pendulous tumors may sometimes form large masses of great weight, hanging down over the normal surface for a considerable distance. They often form folds that overlap one another, and are always very loose. The skin is frequently pigmented and filled with accumulations in the sebaceous glands. Reports of several instances of these enormous growths are to be found in medical literature, favorite places for their origin being the sides of the

neck, the occiput, arms, breasts, buttocks, and thighs. These cases have often been exhibited as freaks or curiosities in museums and travelling shows. Crocker relates a case in which there was an enormous enlargement of the skin of the whole right arm, with a mass of pendulous skin extending from the right pectoral region. There was also great thickening of the right side of the face with large exostoses of the forehead and occiput. There were also tumors on the gums and palate, on both legs, and over almost the whole of the back and buttocks. The skin was greatly thickened, with lobulated, irregular, confluent tumors of the appearance of the ordinary fibroma molluscum. The man was twenty-five years old, stunted, but of average intelligence. The disease was said to have appeared at the age of five years and to have developed gradually since.

Conditions like the preceding have often been called *dermatolysis* or *cutis laxa*, but these names should be reserved for an apparently distinct affection, which is very rare, where the skin may be raised in long folds, recoiling when released like so much india rubber. Cases are on record where the individual was able to draw the skin of his right breast over to his left ear, or to cover his face with the skin of his chest like a veil. In one of these cases the skin was examined, and it was found that the elastic fibres were quite normal, contrary to expectation, but that the connective tissue of the corium was transformed into a myxomatous mass with total disappearance of the connective-tissue bundles. In this respect, as Crocker observes, an analogy with fibroma molluscum may be traced. Other instances of fibroma pendulum have been recorded where the growth, together with the ordinary molluscous tumors, seemed to follow an injury. This condition is to be carefully distinguished from the lax condition of senile skin, and from that produced by great distention and remaining after the removal of large tumors, the termination of pregnancy, etc.

An interesting feature of fibroma molluscum is its frequent association with feeble mental development, and with other physical infirmities. This fact was commented upon by Hebra, who ascribed the origin of these tumors to a constitutional predisposition. In a large number of the recorded cases the disease may be traced back to earliest infancy, and hence an hereditary element has been assumed as active. Virchow has suggested the existence of a sort of cachexia, and in a case published by him the affection existed in three successive generations of the same family. The association of smaller or larger pigment spots upon the skin of those affected with fibroma molluscum has been frequently observed. In a case seen by the writer, a woman, forty-two years of age, had suffered for five years

from valvular heart lesions, and, according to her account, it was not until then that the multiple lesions of fibroma developed. The lesions were small, many of them not raised above the surface of the skin, and possessed the peculiar feature that has been referred to, of receiving the end of the finger as if it were in a pouch or hole in the deeper layers of the skin. Besides these growths she also presented numerous pigment spots over the whole surface of the skin, some small like freckles, others in large patches. There had also been for some time hemorrhagic lesions of the skin, which came and went, leaving pigmentation in their wake. She declared that she had had the pigment spots for a great many years. Her intelligence was below the normal. In another case seen by the writer a young woman of twenty-three, deficient in intelligence, with a marked curvature of the spine, presented scattered over the body numerous tumors, from the size of a pea to that of a hazelnut, which were soft and easily compressible, and, when palpated, gave to the fingers the sensation of entering a pouch as in the preceding case. In this case also there were numerous small and large pigment spots. The woman was also deeply jaundiced.

There is another class of cases of much more common occurrence which are very probably related to fibroma molluscum, namely the so-called *soft warts*, or *acrochordon*. Taylor believes that either in utero or after birth there occurs a protrusion of the soft, rapidly growing derma, caused probably by a subcutaneous new growth, or perhaps a simple sacculation of the skin. A pedicle is soon formed and the contents are more or less absorbed, so that sometimes there is a long thin pouch of atrophied skin remaining which may coil itself up on the surface of the skin as a warty tumor of velvety feeling. As a rule the constricting base has been so cut off that the growth cannot be invaginated, yet this sometimes occurs, which proves, according to Taylor, its analogy to fibroma molluscum.

Besides the form of acrochordon just described there is another kind of firm growth distinctly pedunculated, which may be invaginated by means of a probe. In this case there has been no absorption after the pedicle has been formed, and the tumor is made up of nearly normal tissue, with some increase in the fibrous elements. These tumors are of various colors, according to the greater or less degree of vascularity, and have been called "berries" popularly, from the idea that they have been caused by maternal impression from seeing this fruit. They may be deeply pigmented or covered with hair. These are the nævus mollusciformis, nævus spilus, etc. Besnier also insists upon the analogy between fibroma molluscum and nævi and dermoid tumors, and declares that for a

long time he has called attention to the multiplicity of the different varieties of nævi upon the same individual, whether affected with molluscous tumors or not.

Diagnosis.

The clinical diagnosis of fibroma molluscum is not, as a rule, difficult. The characteristics that have been enumerated—viz., indolent tumors, buried in the skin or projecting and pedunculated, of the color of normal skin, or of various shades of red, according to their vascularity; rounded, flattened or pulled out into the shape of an empty purse, and often capable of invagination, so that the sensation of dipping into a hole or pouch is received by the examining finger, —these are features that make it almost impossible to confound the affection with other conditions. Multiple fatty tumors may slightly resemble those under discussion, but they are not pedunculated, and are flatter and usually lobulated. It may often be difficult to distinguish fibroma molluscum from soft warts or acrochordon, but here the analogy between the two affections seems to be so close that differentiation is not a matter of great importance. It is impossible to confound them with molluscum epitheliale, a totally different affection.

Prognosis.

This cannot be said to be favorable. The mental and physical weakness that is not uncommon in those afflicted with these multiple tumors has already been alluded to. Often the patients have some other deformity or serious internal trouble. On the other hand, some live to advanced age without any apparent influence on their general health from the presence of these tumors. In some cases a state of marasmus or a tuberculosis has finally asserted itself after the affection has been borne for a long period. Mechanically the tumors may by their size or position occasion much discomfort, or even interfere with some of the vital functions. They are often exposed to traumatism from their prominence and may become the seat of severe inflammation, or even of gangrene. They may disappear spontaneously, but this usually is seen only in comparatively young subjects.

Treatment.

Very little is to be said as to treatment. We know of no means other than mechanical which will cause their disappearance. When they are pedunculated they may be removed by the galvano-cautery, by the ligature, the écraseur, or in the case of small lesions by elec-

trolysis. Other tumors may be excised, and the operation should be a radical one, as when a part only of a growth has been removed it has in several instances returned.

LIPOMA.

A lipoma is a tumor composed of fatty tissue, soft in consistence and usually lobulated. It occurs as a rule in the subcutaneous tissue, although it may arise in the skin. It is composed of tissue quite similar to the subcutaneous fatty tissue and is made up of lobules, separated by fibrous tissue in which the blood-vessels are situated. It is usually surrounded by a loosely attached capsule so that it may be easily separated from the adjacent tissues. Lipomata are usually divided into the circumscribed and diffuse varieties.

Circumscribed lipoma is more common than the diffuse variety and presents itself as a firm, soft tumor beneath the skin. These growths vary greatly in size from that of a nut to enormous tumors as large as a man's head. The progress is usually slow. The skin over these huge tumors may be normal, or coarse and wrinkled and œdematous. Ulcers may be formed in the skin either from pressure or from injury, or when large dependent masses are left for a long period without operation. Hemorrhage may also occur. Circumscribed lipomata are usually single, although there may be great numbers of them over almost the entire body.

Diffuse lipoma occurs as a rule in the neck and may be the source of great deformity. Madelung has called it fat-neck. According to Warren it begins as a rule over the mastoid process and behind the ears, and may be on one or both sides of the neck, but in the end covering the whole back of the neck. It does not project above the superior curved line of the occipital bone but may grow around the neck and hang down in front, having the appearance of an enormous "double chin." It is most common in men between the ages of thirty-five and forty-five, and in some intemperance has been an apparent factor. It is not, however, associated with general obesity.

Grosch has found that circumscribed lipomata are apt to be on the shoulders and neck and on the back of the trunk and nates, places where the sweat and sebaceous glands are not numerous; these glands are supposed to derive their power of secretion from the fatty tissue, and his theory is that there is more likely to be an accumulation of fatty tissue where these glands are scanty or wanting.

Under the microscope we find lipoma to be made up of adipose tissue, containing fat cells and traversed by septa, and showing a lobular structure. When much fibrous tissue is present, the tumor

is firmer to the feel and it is then sometimes classed as a fibro-lipoma. Forms of myxo-lipomata, and complications with sarcoma and carcinoma also occur. There may be a deposit of lime salts in the fibrous septa and ossification has been observed. Lipomata develop as a rule from adipose tissue, yet sometimes they have a heteroplastic origin, as when they occur in the submucous layer of the intestine. Their growth is very slow, as a rule, development taking place over a long series of years. They are benign tumors and never occur after removal, and the only symptoms they occasion are associated with the discomfort caused by their size and weight. They rarely disappear spontaneously. Complete excision is the only remedy, but it is always successful if the whole growth is enucleated. In the diffuse form dissection may be difficult, and a series of operations may be required before the whole growth is removed.

NEUROMA.

A neuroma is a tumor composed of nerve tissue. In many instances, however, tumors regarded as neuromata have been shown to consist largely of fibrous tissue, the nerve elements entering but slightly into their composition. Neuromata are found sometimes as multiple tumors occurring in several different places along the nerve trunks, or they may be scattered over the body. The "painful subcutaneous tumor" that has been described by Paget is more common in women than in men, and is situated beneath the skin. These are not, however, pure neuromata, as they have been shown in some instances to be made up of muscle tissue, or of new-formed vessels, the pain being probably due to the entanglement of the nerve fibres in the mass. In fact it is seriously questioned whether any of these tumors are distinctly entitled to the name of neuroma, as there is almost always a fibrous or sarcomatous complication.

A very rare form of cutaneous tumor has been described by Duhring under the name *neuroma cutis dolorosum* or painful neuroma of the skin. This, together with one by Rosinski, are the only recorded examples. Duhring's case has been recently well pictured in the "International Atlas of Rare Skin Diseases," and may be briefly described. The patient was an Irishman seventy years of age when he first came under observation, and the skin affection had begun ten years previously by the appearance of several split-pea-sized papules on the left shoulder, not accompanied by pain. The pain did not appear until three years later. When seen, the disease consisted of numerous elevated, flattened tubercles of the size of a split pea, covering the left scapular region, the shoulder, and the extensor aspect of the arm

down to the elbow. They were discrete in places but the centre was made up of a plaque of closely aggregated tubercles. The nodules were very firm to the touch, of a pinkish or violet color, varying according to the position of the limb, the temperature, and the presence or absence of pain. The color became much redder during a paroxysm of pain, and the patch became much warmer to the touch. The tubercles were all painful and extremely sensitive on pressure. Distinct paroxysms of pain were the most marked feature of the disease, and these were of great intensity. They lasted in their worst form for about half an hour. These attacks were often precipitated by any excitement or distress of mind, or by exposure to cold air, and a change of weather seemed to influence them. The affection had no effect upon the general health. Morphine subcutaneously gave little relief. At one time there was much diminution in the pain for six months, following exsection of the brachial plexus, but the pain gradually returned and two years after the operation was as bad as ever. The patient lived to be eighty-three years old, death occurring from senile debility. The brachial plexus and nerves of the arm were found after death to be involved in no new growth. The nodules that were excised showed a connective-tissue stroma, in the meshes of which appeared the new-formed elements, which consisted of non-medullated nerve fibres. There were also yellow elastic fibres, blood-vessels with thickened walls, and small round cells surrounding the vessels. No unstriped muscle fibres were found in the new growth.

XANTHOMA.

Xanthoma is the name given to patches or nodules of a more or less bright yellow color, or sometimes paler and of a dull straw hue, situated usually upon the eyelids, but at times present on other parts of the body, usually sharply bounded from the normal integument, and looking at first sight like simple discolorations of the skin.

This affection was first described by Rayer in 1835 as plaques jaunâtres folliculeuses, plaques jaunâtres des paupières; by Addison and Gull in 1851 as vitiligoidea; and by Erasmus Wilson in 1867 as xanthelasma. It was later called xanthoma by Smith, and this name is now generally accepted by all the various schools, xanthelasma still retaining a certain degree of currency. The derivation is from the Greek adjective ξανθός, yellow.

Xanthoma is not on the whole a common affection, and yet when occurring in one or two isolated patches on the eyelids, it is not regarded as very unusual. Cases of generalized xanthoma, on the contrary,

are very rare. The growth is usually described as occurring in two forms, xanthoma planum, and xanthoma tuberculatum or tuberosum. Xanthoma planum is the variety most frequently met with on the eyelids, and occurs in the form of patches or plates. These plates are usually small, rarely attaining the length of an inch in their long diameter, sharply bounded, and apparently embedded in the corium. They are soft to the touch and the skin does not give the sensation of being thickened, nor is there any wrinkling or scaling of the surface. They are very slightly, if at all, raised above the surface of the skin, and are usually of a dull-yellow color. There is rarely any pruritus or abnormal sensation at the site of the tumors. They are rather more frequent at the inner angle of the left upper eyelid, and, although usually met with as one or two isolated spots, they may become confluent so as to form a band extending around the eye. In most instances the affection will remain limited to one eyelid, or perhaps appear symmetrically on the other. Rarely it may invade the upper parts of the cheek or the skin of the nose or ear.

Xanthoma tuberculatum or tuberosum is the name applied to nodules of the same color as the plane variety, which project more or less above the skin's surface, and which vary in size from that of a pea to tumors as large as a small orange. They are isolated, oval or round in shape, or may become confluent so as to form striæ and bands. This form is rarely seen upon the eyelids, but has as its seat of predilection the extensor surfaces of the limbs, the fingers, toes, elbows, and knees, as well as the palms and soles. When xanthoma is found in a number of different places, and is not confined exclusively to the eyelids, it is called xanthoma multiplex. The lesions may be of either the plane or the nodular variety, or both forms may be found associated in the same individual. Sometimes the lesions are very widely distributed, affecting not only many parts of the skin, but also the mucous membranes. The conjunctiva, the mucous membranes of the mouth and throat, as well as those of the larynx, pharynx, and œsophagus are sometimes involved. There may be lesions also on the capsule of the spleen and liver, on the peritoneum, about the rectum and bile ducts, etc. They have been found also on the sheaths of the tendons, and on the inner coat of the arteries. In some instances a certain definiteness has been observed in the arrangement of the lesions, as in a case reported by Hardaway, where a zoster-like order was maintained, and as in a case of Köbner's, where xanthoma developed in the course of a nævus vasculosus. Occasionally the lesions are confined to peculiar positions, as in a case of Robinson's, in which they appeared upon the elbows without affecting any other part. Cases are also reported where they came first upon the cheek,

nates, root of the penis, etc., and in some of these instances the eyelids were subsequently affected.

Besnier makes another division of this affection, that of xanthoma "en tumeurs." This form is more surgical than medical, and is generalized and symmetrical, without internal lesions, so far as has been observed. We find succeeding the plaques and nodules large tumors either isolated or confluent, sessile or provided with a pedicle, from the size of a nut to that of a hen's egg. The seats of predilection are the elbows, knees, and parts exposed to much pressure. The affection is either congenital or is developed in the first months or years of life.

Most of the reported cases of xanthoma tuberosum have been observed in England, and it is possible that the affection is more frequently met with there than on the continent of Europe or in the United States. It is certainly of rare occurrence in America. Xanthoma in children is anatomically the same as in the adult, although according to the report of the Xanthoma Committee in England it differs in that it has no connection with disease of the liver. The committee declared too that the eyelids are not affected, and that the nodular form is more often seen. These statements must be somewhat modified, however, according to Crocker. He mentions a number of instances where the eyelids were affected and where the plane variety was well represented, and believes that slight forms of xanthoma are not so uncommon in children as has been supposed.

Xanthoma of the eyelids is stated to be more common in females than in males, and is most prevalent in adult life. Although, as a rule, it is difficult to trace the affection in the family of the patient, certain instances of undoubted heredity are on record. Church has reported an instance where, of twelve people who had reached the age of forty, three of the first generation and two of the second suffered from xanthoma. Another case is mentioned by Hilton Fagge where a mother and daughter had the affection, which had been in the family for four generations. It has been known also to skip a generation. Crocker believes that it is more common in people who have dark complexions and much pigmentation about the orbit, and also that migraine is an important factor in its causation. This assertion does not appear to be borne out by the cases observed in America.

The association of jaundice with xanthoma has long been remarked, the only difference of opinion being in just what proportion of cases the former is present. Kaposi states that jaundice was present in fifteen cases out of twenty-seven observed by him. Crocker declares that there are probably not more than sixty cases of xanthoma multiplex in persons above the age of puberty on record, and

that four-fifths of these have been associated with jaundice, due variously to stricture of the duct, gall stones, cancer, cirrhosis, etc. And yet, if jaundice is a factor etiologically, as would seem from what has been said to be pretty clearly proved, the way in which it acts is most puzzling and inexplicable. Some writers, among them Besnier, have argued that the yellow tint of the skin is not due to biliary coloring matter in every instance, but that there is a condition of the skin which they have named "xanthodermie." They do not deny that jaundice is sometimes associated with xanthoma, but they think that the yellow coloration is not always explicable in this way in cases where no bile pigment is found in the urine and where the conjunctivæ and mucous membranes are not affected. Gout is also considered by some writers to be a factor in the etiology of xanthoma.

Anatomy.

The anatomy of xanthoma has been studied of late years by Chambard, Touton, Crocker and others. In the time of Hebra it was thought that the sebaceous glands were involved, and that the affection belonged in the same class as milium. It has been found, however, since the introduction of modern and more accurate methods of histological study, that the large cells filled with fat granules are in no way connected with the glands. These cells lie in the lymph spaces between the bundles of connective tissue of the corium, and are provided with a distinct membrane and a large round or oval nucleus. They are finely granular and are filled with closely aggregated fat drops. They vary from the size of epithelioid to that of large giant cells such are seen in sarcoma. These are the so-called xanthoma cells, that chiefly make up the tumor and are absolutely characteristic. The nuclei may be multiple, reaching as high as twenty or thirty. In some of these cells dark-brown pigment granules may be seen between the drops of fat. Chambard believes that we have to do with a chronic inflammatory process, where there is at the same time an increase of connective tissue and a fatty degeneration. In the firm, raised nodules the connective-tissue growth is more prominent, while in the soft patches there is a predominance of the fatty change. Touton, who has done the most extensive work on this subject, considers xanthoma to be a new growth, consisting of new-formed connective tissue (or endothelial) cells with an abundant deposit of fat. He points out its relationship to certain pigmented nævi, where we also find groups of new-formed cells, lying apart and evidently derived from the connective-tissue elements. He also finds among the xanthomata certain mixed forms which may be classed

as multiple-, round-, spindle-, or giant-celled sarcoma with the characteristics of xanthoma. There are also tumors in which a cystic degeneration of the xanthoma cells may be traced. The color of the tumor is probably due to the deposit of fat.

Diagnosis.

The diagnosis of xanthoma is not difficult, as a rule, to one who has met with the affection before. Milium has sometimes been confounded with it, as well as multiple, benign, cystic epithelioma. Urticaria pigmentosa in some cases bears perhaps the closest resemblance to xanthoma, and instances of this disease have been reported as xanthoma multiplex. The points of distinction are the firmness of the lesions in xanthoma, and the absence of itching, or of any appearances like wheals.

Prognosis.

The lesions progress as a rule up to a certain period in life and then become stationary. In certain rare instances they have been known to disappear spontaneously.

Treatment.

Excision is the method that has been usually practised. When the growth is situated on the eyelids, one must be careful not to cut too deeply, on account of the danger of a resulting ectropion. Very good results are obtained by the modern method of electrolysis. The growth is transfixed in various directions through the base by a needle attached to the negative pole of the galvanic battery. From one to two milliampères may be safely used as a rule. It is often wise if the best cosmetic result is desired, not to attempt to destroy the whole growth at once, but to repeat the process after an interval. In this way the amount of destruction may be more accurately regulated.

Xanthoma Diabeticorum.

Xanthoma diabeticorum has been the subject of much difference of opinion of late years, the mooted point being that of its identity with the ordinary forms of this disease. It is a rare disorder, less than twenty cases having been recorded. It has been studied chiefly by the English, and Malcolm Morris was the first to assert its claims to an independent position.

It is characterized by firm, red, raised nodules, either discrete or confluent, sharply bounded from the surrounding skin, and of a

rounded or oval shape. The color of the nodule is chiefly red, but at the apex it is yellowish, giving the impression oftentimes of a pustule. When incised, however, it is always found to consist of solid tissue, and nothing but blood is exuded. When the skin is put firmly on the stretch these yellow centres become more apparent. Sometimes there are dilated vessels running over their surface. The lesions are especially common on the extensor surfaces of the body, and the elbows, knees, and buttocks are mentioned as favorite seats in most of the recorded cases. In these positions they are very often confluent. They have also been seen on the scalp and face, and on the mucous membrane of the mouth. Unlike the ordinary form of xanthoma, they have never, with one exception, been found on the eyelids, nor in the flexures of the joints. The eruption may appear with very numerous lesions, or with comparatively few, the latter being the more common condition. The affection is characterized by a great rapidity of development, the lesions appearing suddenly on the extensor surfaces of the arms and legs, and extending gradually to other parts. Another feature is their involution. Unlike the ordinary forms of xanthoma, after remaining stationary for a period varying from months to years, they begin to disappear rather suddenly, and leave no scar. Not infrequently, however, they reappear later on.

Almost all of the cases that have been reported were in men under fifty. Diabetes is found in almost all instances, but a few cases have been described by Hutchinson, Besnier, and Vidal where this complication was not a feature. Many of the patients have been stout and ruddy, their appearance not being at all characteristic of diabetes.

Anatomically, most histologists are agreed that the lesions of xanthoma diabeticorum do not differ essentially from those of the ordinary xanthoma. Some have thought that the former exhibited more inflammatory appearances and less growth of connective tissue.

In 1883 a committee was appointed by the London Pathological Society to examine the question of the identity or non-identity of xanthoma diabeticorum and ordinary xanthoma. The points of difference between the two forms were described as follows: 1. In xanthoma diabeticorum there is a sudden evolution and involution of the lesions; 2. The nodules are firm, while in ordinary xanthoma they are soft; 3. Only a part of the lesions are yellow and these only at the apices, while in xanthoma they are of a uniformly yellow hue; 4. The lesions are all distinctly raised and nodular, and never appear in the form of striæ or patches, as is so common in xanthoma; 5. There is no jaundice, but usually diabetes mellitus accompanies the affection, and this is not met with in ordinary xanthoma; 6. The lesions are often found in the immediate neighborhood of hair follicles; 7. The

microscopical appearances are not quite the same. This last objection to their identity does not seem to have stood the test of further experience. It may also be noted that there are numerous instances of ordinary xanthoma without the association of jaundice, nor do all cases present striæ or exhibit a uniform yellow color. It is also rational to assume, with Besnier, that the rapid evolution of the lesions of xanthoma diabeticorum accounts for their more inflammatory character. Until further light has been thrown upon this rare phenomenon, it is to be considered a variety of the ordinary xanthoma, entitled, however, to a place by itself on account of its many peculiarities, and in order to facilitate more extended study.

As regards *prognosis*, these lesions disappear spontaneously, as has been said, usually in the course of a few months, sometimes after the lapse of several years. A recurrence is not uncommon.

In the *treatment* of the affection, the ordinary dietetic and hygienic measures that are recommended in diabetes exert a favorable influence on the nodules.

MYOMA.

Virchow and Förster were the first to call attention to the myomata, tumors composed of new-formed muscle tissue. Virchow recognized several species of myoma of the skin, which are usually of a mixed nature, and only true myomata when they are found in regions where the normal skin tissue is characterized by a sort of muscular hypertrophy. The best work on this subject has been done by Besnier, who published the result of his studies in 1880 and again in 1885. He divides the cutaneous myomata into two varietes: (1) *Myomes simples* or *lio-myomes*, and (2) *Myomes dartoiques*.

Simple myomata are found on all parts of the integument and are always multiple. They are of small size and have a slow course; at first they are painless, later on very sensitive to the touch; they are benign and do not reappear after excision. In one of Besnier's cases uterine myomata had preceded the skin affection.

Dartoic myomata are usually single. They are found on the scrotum and the labia majora and may attain quite a large size, that of the fist for example. They may be sessile or pedunculated, and may be lessened in size by the action of cold, of the electric current, or of irritating agents.

Only a very few cases of the small multiple variety of myomata are on record, probably not more than ten. Among those who have described these tumors are Verneuil, Besnier, Arnozan (a pupil of Besnier), Brigidi and Marcacci, Hardaway, Jadassohn, Hess, and

Lukasiewicz. Jadassohn's first case was in a young woman of twenty-nine, and the tumors had first shown themselves ten years previously. The parts affected were the extensor surfaces of the right arm, the posterior part of the axilla, and a spot at the base of the shoulder of about the size of the palm. A few small lesions in the form of bands were seen below the clavicle. There were small, sharply defined papules, slightly raised above the surface, of a reddish color and firm consistence, and disappearing on pressure. Besides these small lesions there were irregular tumors, of a deeper color than the papules, some as large as a hazelnut, and of the consistence of cicatricial tissue. Besides these there were many intermediate forms, some resembling at first sight patches of urticaria. The nodules were all deeply seated in the corium and were pretty closely aggregated. The lesions were very sensitive to pressure, and there were severe paroxysms of pain, which occurred seven or eight times a day and often disturbed the sleep at night. These paroxysms usually began in the larger lesions on the arm and spread rapidly to the hand, lasting as a rule about ten minutes.

The second case was in a woman of thirty-seven, in whom the affection was said to have begun in the first year of life, after vaccination. The extensor surface from the middle of the arm to the wrist was occupied by lesions from the size of a pinhead to that of a bean, of a dull-red color and of a round or oval form. They were more or less raised and confluent. The primary stages of the affection were well seen in this case, seated especially at the periphery of the plaques, where they were observed to have formed about the hair follicles. The patient declared that some of the nodules had disappeared spontaneously. There were no subjective sensations, and the nodules were not painful upon deep pressure.

The histological examination of the first case showed a typical myomatous tissue. The neoplasm began immediately below the pars papillaris, and consisted of bands of muscle fibre, separated by large masses of connective tissue, the new-formed muscle tissue increasing and becoming more compact towards the centre of the growth. The whole growth was traversed by a dense mass of elastic fibres and mast cells. In the second case the small papules were of the same histological character as in the first case.

These cases support the view that the multiple myomata of the skin are derived from the erectile muscles of the hair, as in the second case the smallest tumors could be seen to be developed about the hair follicles.

Lukasiewicz's case was in a man of twenty-three, and the affection had begun at the age of four and one-half. The lesions were seated

on the extensor surface of the lower half of the left thigh, and consisted of about thirty round or oval, reddish-blue nodules, the largest the size of a pea, slightly raised above the surface of the skin. There were also numerous lesions on the extensor surface of the left leg, similar to those on the thigh, but of larger size, and more closely aggregated. When the parts were gently touched, a violent trembling of the whole leg occurred, and on moderate pressure severe neuralgic pain was caused. Histologically, the tumor was found to consist of new-formed muscle fibres, as in the case previously described. The muscular tissue projected farthest upwards at the site of the hair follicles, so that the entire follicle seemed to be enveloped with the muscle bundles. No nerve fibres could be detected in the growth, to explain the great sensitiveness of the tumors. The patient, when seen five months later, declared that the pain had been much relieved, and the number of nodules was found to have decreased considerably. Lukasiewicz found in the peripheral parts of the nodules an increase of muscular tissue about both the vessels and the sweat glands, and could even trace the growth from these structures to the body of the tumor. He thinks it probable therefore that the growth is derived from the muscles of the hairs, the vessels, and the sweat glands. The extreme sensitiveness is attributed to the pressure of the tumors on the sub-lying nerve fibres.

Taking together the cases of multiple myomata that have been reported, it is found that all but two were in males. Besnier's view that the disease occurs only in elderly people is not borne out by Jadassohn's and Lukasiewicz's cases, which were in young people. The lesions begin as small red nodules, embedded in the skin and firm to the touch, and gradually increase in size. In some cases they may disappear. They develop in patches without any regular arrangement, and are generally limited to one or two parts of the body. The upper extremities have been more frequently affected than the lower in the cases thus far reported, and the lesions have also been noted on the trunk, the back, and the nose. The extensor surfaces seem to be more often affected than the flexors. In almost all the cases there was acute pain on pressure, and in several distinct paroxysms of pain of an excruciating type, occurring at irregular intervals and lasting for ten or more minutes, were experienced.

The diagnosis of these tumors may not always be easy, as clinically they may closely resemble other skin lesions. As distinguished from the neurofibromata of the surgeons, the "tubercula dolorosa," they do not lie in the course of any of the nerves, and they are not at first painful. The lymphangioma tuberosum multiplex of Kaposi is similar, as a case that was first considered by Lesser to be an instance

of multiple myomata, was found on histological examination to belong in the former category. As Crocker points out, it is often difficult to tell the nature of cutaneous and subcutaneous nodules without the aid of the microscope, and in many cases it is impossible.

The single myomata, Besnier's dartoic myomata, are much more common than the multiple, and are usually painless. Virchow, however, has reported a case where the pain was excessive. They are composed chiefly but not wholly of muscular tissue, and there may be so much fibrous tissue that the name fibromyoma is more suitable. They are also often complicated with new-formed blood and lymph vessels, forming angiomyomata and lymphangiomyomata.

In Lukasiewicz's case there was a distinct diminution of the tumors under the use of arsenic. A number of them were excised and left flat, deeply pigmented, painless scars, with no signs of a reappearance of the growth. In another area, however, there were a few new lesions. If the tumors are so numerous and closely grouped as to preclude excision, a protracted trial of arsenic would seem to commend itself. In the case of single myomata, excision is the only method of treatment.

ANGIOMA.

Properly speaking, angiomata are tumors made up of new-formed blood-vessels. In many of these tumors there are also a large number of dilated vessels which go to make up the mass, and it has therefore become customary to include in the class of angiomata tumors composed entirely of dilated preëxistent vessels. Lymphatic angiomata are called lymphangiomata.

Angiomata possess very marked clinical characteristics, their color and prompt disappearance on pressure revealing their nature readily, as a rule. There is much diversity of opinion as to the proper subdivision of the angiomata, and opinions vary as to the proper limitation of the word telangiectasis. Its literal meaning is enlargement of the terminal vessels, or capillaries, and it is true, as Besnier says, that strictly speaking such an enlargement may be congenital or acquired, primary and idiopathic, or secondary and symptomatic. As symptomatic the term may be used purely as an adjective to designate the kind or variety of the lesion under discussion. Nevertheless, it has become more or less the custom in dermatology to limit the use of this term to the acquired capillary dilatations, that are arborescent and anastomosing and situated usually upon an erythematous base. For convenience of description this interpretation will be adhered to, and the group of telangiectases will be separated from the nævi vasculosi, which will be first considered.

Nævus Vasculosus.

The vascular nævi are vascular hypertrophies of the skin, circumscribed in their extent, but varying greatly in size from that of a pea, or even smaller, up to large tracts which may cover the greater part of an arm or leg. They are either present at birth or appear during the first months or years of life. It is to be borne in mind that the statements of the parent or nurse as to the time of development of a lesion in early life may not always be accurate, as many small marks may escape notice, or there may be lesions present histologically which have not yet declared their presence to the naked eye. Vascular nævi are usually of a light-red color or vary in shades of redness, some of them having a purple hue. One of their characteristics is that they pale or even disappear when firm pressure is brought to bear on them, the color slowly returning when the pressure is removed. In form they vary greatly. They may appear as diffuse flat patches, of usually a bright-red color, somewhat raised above the surface of the skin, or not at all elevated; occupying a very small area, or covering the whole side of the face and extending to the neck and chest. This form has been variously named "port-wine mark," nævus flammeus, "Feuermal," and tache de feu. In some cases these marks may present a perfectly smooth surface, and the vessels which cause them may be so small and evenly distributed that the redness is perfectly uniform. In other instances the surface shows irregularities, with nodular elevations, or hypertrophies of the horny layer causing wart-like protuberances, or there may be an increase in the fibrous tissue of the corium. The favorite seat of port-wine marks is the face, where they are very apt to be unilateral, or they may be distributed in a symmetrical fashion over all of one side of the body. The flat variety of vascular nævus is also found very commonly on the scalp at the base of the occiput, where it is covered by hair and rarely attracts attention. If this point is examined into, it will be found that a surprisingly large proportion of people present these spots without, as a rule, other nævi upon the cutaneous surface.

Another form is the nævus araneus, or "spider cancer," which may increase up to a certain point and then remain stationary during the life of the individual. It consists of a small central red point, usually somewhat raised above the surface, from which project dilated vessels on all sides in the form of a star. This form readily disappears under pressure with the finger, and is distended and becomes deeper in color under excitement, as from crying. The growths are not always congenital, as they may appear at any age, but are most common in children.

The forms described above are usually due to a dilatation and new growth of the cutaneous capillaries. There are also forms of venous nævi, which are prominent, elevated tumors, lobulated or smooth, sometimes pulsatile, soft, and easily compressible. They may attain very large dimensions, and are met with on the lower parts of the body often, but also on the neck and face. They may be covered with smooth skin, or dilated vessels may be evident. These tumors may involve the skin alone, or extend deeply into the subcutaneus tissues and send prolongations into the adjacent regions. They are found also upon the mucous membranes. The growths may sometimes become very formidable, progressing rapidly and covering large areas, and death may occur from hemorrhage. The so-called cavernous forms are most liable to this course. They belong more properly to the domain of surgery.

The vascular nævi as a rule increase gradually during the first months or years of life and then remain stationary. Oftentimes, however, they disappear spontaneously, leaving a more or less visible cicatrix according to their elevation and extent. They either occur singly, or a large number may be present on the cutaneous surface, and they may be combined with warty or pigmented growths. Under the influence of coughing, crying, or other exciting causes, they may become more prominent and turgid, and this is especially noticeable in those situated upon the face. The raised and turgid forms are always exposed to some danger from traumatism, and inflammation and gangrene may occur in consequence. These results may sometimes, however, lead to the cure of the growth. The growth when of large size may sometimes be the source of great pain of a neuralgic character, caused by pressure on the nerve filaments. Pulsations synchronous with those of the heart are sometimes met with in the elevated forms, and a bruit may be heard on auscultation.

Anatomically the vascular nævi are situated in the upper part of the corium, in the papillary layer. They represent new-formed and dilated capillary vessels anastomosing with one another and irregularly intertwined. In the forms that present more or less hypertrophy and firmness, there is a growth of connective tissue about the walls of the vessels, and this may increase to such an extent that a condition resembling elephantiasis may result. The cavernous form is characterized by a system of cavities of regular shape, separated from one another by connective-tissue partitions. This tissue resembles the cavernous tissue of the penis.

The treatment of the vascular nævi will be considered after the discussion of the remaining forms of angioma.

Telangiectasis.

Under this heading we may consider the superficial forms of angioma which have not been included among the vascular nævi, repeating what has been already said, that, properly speaking, no sharp division can be made between telangiectasis and some forms of capillary nævi. The nævus araneus, or "spider cancer," for example, may or may not be congenital and is in either case a telangiectasis. As a rule we apply the term telangiectasis by preference to angiomata where dilatation is more prominent than actual new formation of vessels.

The nævus araneus is usually single, and occurs especially in children on the nose, cheeks, and near the eyelids. The lesions are not infrequently seen also in considerable numbers scattered over the whole body. They are usually small, but may sometimes cause anxiety by a pretty rapid growth, which does not, however, extend beyond a certain point, where they remain stationary, or they may in time disappear. They may appear without apparent cause at almost any age. They are very common in people with a delicate skin. Sometimes they have been found to follow an injury, but usually there is no assignable cause.

Telangiectases are not infrequently seen in and about cicatrices, caused probably by the destruction of a part of the capillaries, which leaves the rest in a condition favorable to hyperplasia and dilatation. They are often consecutive to disease processes such as lupus erythematosus, tuberculosis, and syphilis. The writer has seen a very marked and disfiguring instance consecutive to a severe erysipelas, where the whole nose and the upper parts of the cheeks were covered with large and small anastomosing vessels of a deep-red color. They may also appear after severe burns, scalds, etc. Pressure from tumors is also a cause for their appearance.

The most important form of telangiectasis with which the dermatologist has to deal is *rosacea*. This condition is often an accompaniment of acne and is then described as acne rosacea, but rosacea may occur independently of acne. It is often seen in men who lead an out-of-door life and are exposed constantly to the wind and sun, as sailors and coachmen, and has its seat chiefly upon the cheeks and nose, where the vessels, dilated in varying degrees, may be seen in a network of anastomosis. This condition is also caused by anything producing a long-continued congestion, or by any obstruction to the venous circulation. The tissue about these dilated and new-formed vessels may become hypertrophied and various nodular projections

and deformities are produced, especially upon the nose. In some cases telangiectases have been found occupying a large portion of the surface of the skin, and they may appear on the mucous membranes, or upon the conjunctiva. Small telangiectases sometimes disappear, but in most cases the affection progresses up to a certain point where it remains stationary.

TREATMENT.

The treatment of angioma is based wholly upon surgical principles. It is not the province of this article to discuss the various surgical procedures that have been recommended for the larger growths. The arteries that supply the tumor have often been ligated, and sometimes amputation has been resorted to. We shall concern ourselves here with the strictly dermatological methods that are in use for the destruction of the various vascular nævi and telangiectases. The different forms and natures of these growths render desirable the use of different methods of treatment according to the individual case. The methods recommended are by no means few, and in certain cases several of them may be combined with advantage.

When we are dealing with a vascular nævus of small size, sharply bounded from the normal tissue and in a position where the loss of substance caused by its removal will not cause deformity or inconvenience from contraction, the growth may be excised with the knife. The incisions should be made well outside of the limits of the growth. Lister has successfully removed very large nævi by this means. The *ligature* is another means of treating these large growths, and the best method, according to Crocker, is to pass a large nævus needle under the tumor, thereby raising up the growth somewhat; another needle with whipcord tied to it by a piece of silk is then passed under this. The needle to which the cord has been attached is then withdrawn, and the doubled cord is drawn through with the silk; the other needle is then threaded, and the doubled cord is drawn through as it is withdrawn. Then the looped ends are cut, and the cord of one pair is tied tightly with the adjacent cord of another pair, so that the growth is divided into quarters. The skin is to be divided with a knife so that a groove may be formed for the ligature to sink into.

Another procedure is called the *Marshall Hall method.* This consists in transfixing the growth in various diameters with a cataract needle, pushing the latter about in various directions after it is introduced without entirely withdrawing it. It is distinctly inferior to electrolysis.

Compression is a method that has a very narrow field of usefulness, as it is only in particular situations and in connection with

particular forms of angiomatous growth that it can be made use of. When we have a small, flat, or only very slightly elevated lesion, situated on the forehead, upper lip, scalp, or in some place where there is an underlying bed of bone to exert counter-pressure, compresses applied over the tumor and kept in place by rubber bands are sometimes successful. The details of this procedure must be varied according to the individual case, and much ingenuity may be displayed in regulating the amount of time and pressure used. Besnier declares that he has had some excellent results from this method, which is seldom used, as a rule, and has proved inferior to other forms of treatment. It may be resorted to when timidity toward more radical measures is shown.

Chemical caustics are often applied, and were the chief agents in removing small angiomatous points and the so-called spider cancers before the introduction of electrolysis offered us a better method for these forms. Strong nitric acid and the acid nitrate of mercury may often be used in destroying vascular nævi of moderate size. Nitric acid has also been used in more diffuse conditions, such as port-wine mark, where the growth is "spotted" at close intervals by this means, the result being the substitution of a large number of minute cicatrices for the diseased tissue. Ethylate of sodium has been claimed to have the advantage, when painted on, of causing little pain. This claim has not been borne out by universal experience, however, and some who have used the ethylate declare that it has no advantage over nitric acid or the other chemical caustics. The injection of various irritating fluids into the growth has had its advocates, and certainly it may often be effective. Carbolic acid, perchloride of iron, tannin, etc., have been used in this way, but the method is objectionable on account of the danger of producing greater destruction than was intended, and cases of sudden death from the entrance of these substances into the circulation have been recorded. Electrolysis has in the best hands superseded the use of strong caustics. With the latter the amount of destruction that will be produced is always a matter of uncertainty, and may go far beyond the bounds of what was originally intended.

Vaccination is another method that has been used for the destruction of angiomata, but it can hardly have any place to-day, in the presence of so many better and more certain means. It has been applied chiefly to the small, flat nævi, and the scar that results from it is said to be irregular and unsightly.

Multiple linear *scarification* was introduced and enthusiastically advocated by Balmanno Squire, twenty years ago. Naturally, this method is applicable chiefly to the flat superficial varieties of vascu-

lar nævi, and to the varying conditions of rosacea and of telangiectasis. Squire made use of a cataract needle of about four times the usual size, or of a scalpel simply, practising parallel cuts or scarifications about one-sixteenth to one-thirty-second of an inch apart. This process was repeated at intervals of a few days, or as soon as the last cuts had healed. At each operation the direction of the parallel incisions should be slightly changed, so that the cuts of the second operation run obliquely to those of the first. The depth of the incisions he gives as about one-sixteenth of an inch. Every part of a port-wine mark has to be scarified a great many times before the desired result is obtained. Others have not had the success with this method that its originator enjoyed, and Crocker has seen two of Squire's cases that were not much, if at all, improved after fifty sittings. Besnier and others of the Paris school, however, regard this method with favor, if it is properly performed and perhaps combined with other measures. It is to be done according to Vidal's method as applied in lupus, is to be combined with compression whenever that is possible, and has to be repeated a very great number of times. As soon as a small territory has been scarified, it is to be covered with compresses of absorbent cotton, so that as little blood as possible need be lost. The surface may be previously rendered anæsthetic by use of the chloride of methyl. There is no doubt that the success of operations like the above depends mainly upon the skill and experience of the operator, and that a great deal of practice is needed before it can be properly done. The results obtained by scarification in various processes by the staff of the St. Louis Hospital in Paris are much better than those reported elsewhere, and the reason is to be found in the care with which the details have been worked out. It is in this class of operations especially that individual dexterity is of greatest value.

Electropuncture by means of specially constructed fine needles is a method often resorted to, and is popular in France, where it is used for many other purposes also. The electro-cautery is considered preferable to the thermo-cautery, because the latter is more likely to exceed the necessary limits of the destructive action. The needle should never be kept at a white heat, so that there may be as little hemorrhage as possible. This method is especially applicable to small, raised forms of angioma. It is not so well suited to the treatment of the so-called "spider-cancer" as electrolysis. For more elevated and extended lesions Besnier recommends a tattooing with the electro-cautery. It is necessary to be careful not to exceed the limits of the lesions either in depth or in surface extent.

Electrolysis is a most valuable method for treating many forms

of angioma that has been introduced of late years. Its use was at first limited to the destruction of superfluous hair, having been introduced by Hardaway, of St. Louis. Later its application was extended to various blemishes and new growths of the skin, and at one time the most confident hopes of its efficacy in treating port-wine mark were excited. It has not, as will be seen, fulfilled the expectations that were raised with regard to this, but it has proved the best method for some other forms of angioma. The writer has used the method in many cases during the last ten years, and has also experimented with it quite extensively, and much of the following matter was contained in a paper on electrolysis in the treatment of cutaneous affections, published in 1892.

There is no other treatment nearly so good as electrolysis for the treatment of the small, punctate, angiomatous spots with radiating offshoots of dilated blood-vessels, the so-called "spider cancers." A needle attached to the negative pole of a galvanic battery is inserted into the centre of the lesion, at the point from which the radiating branches diverge, and the current is allowed to pass for a few seconds usually. The needle used is somewhat larger than that employed in treating hypertrichosis. The positive pole of the battery is connected with a copper electrode covered with absorbent cotton, and is either applied to the patient's body by the operator, or the patient is allowed to hold the electrode by the handle and make and break the current when directed, by placing the electrode on his arm or hand. Some operators have recommended that the use of the poles be reversed in treating angioma, and that the needle be attached to the positive pole. The strength of the current should be graduated according to the size of the growth and should in general be somewhat stronger than that used for hypertrichosis. When the needle is inserted, and the current passed, a blanching of the dilated capillaries is immediately seen, beginning at the point where the needle has entered the skin and extending peripherally until the minute radiating vessels have ceased to be apparent to the eye. If cautiously done, no trace of the operation should be left; the pain is trifling and in many instances is well borne by quite young children. It may rarely be necessary to reinsert the needle at a subsequent sitting, if, owing to an especially sensitive skin or any other reason, it has been thought wise to begin with a feeble current and to proceed cautiously.

In the case of more extensive lesions, those up to the size of a pea and larger, a similar procedure is often effective. If the lesion is raised above the level of the surrounding skin, it may be removed by passing the needle through its base in various places, allowing the current to pass but a short time at any insertion. It is impossible to

lay down any very definite rules for guidance. A certain measure of experience will prove of the greatest value in determining the results attained. Some have recommended the insertion of two needles, one connected with either pole of the battery, but with this method I have had no experience. I have always used a needle attached to the negative pole of the battery, and in the case of small, isolated angiomata the results have always been satisfactory. It may occasionally be necessary to make use of an especially strong current or to repeat the operation once or twice, owing probably to a subcutaneous arrangement of vessels into which the needle does not enter.

Hardaway also was the first to suggest the use of electrolysis in the case of telangiectasis and of rosacea. It is most important, as he observes, that the operator should control the destroying agent as much as possible. Hence he never uses a bundle of needles, as some have suggested, but confines himself to a single one. If this is used carefully, suppuration and scars may be avoided, which have been of common occurrence in cases in which many needles were used. The needle attached to the negative pole is introduced either perpendicularly or parallel to the vessel to be destroyed, and the current is allowed to pass a longer or shorter time, according to the size of the vessel and other indications. The operation is pretty tedious, for when the puncture has been made the region surrounding becomes blanched to such an extent as to make it difficult to determine the next point to be treated. An inflammation follows the operation, slight, to be sure, but sufficient to mask the lesion, so that it is necessary to wait for several days at least.

From my own experience, I should not wish to recommend this as the only method of treating the different grades of rosacea, although I should be very sorry to be deprived of its aid. In the milder forms, where the redness is equally distributed over the affected surface, and where the individual lesions are with difficulty or not at all perceptible when the skin is put upon the stretch, electrolysis has proved of very varying usefulness. In many cases no permanent result has been obtained, although I have tried many different ways of inserting the needle, and many variations of detail. The collateral circulation is apt to be so complete that it is simply impossible to destroy enough of the minute, invisible branches to prevent the blood supply from returning, sooner or later, to its former seat. In other cases of this sort a number of trials at intervals of a week have served to modify so completely the annoying conditions that much satisfaction has been expressed by the patient; and on the whole my experience has not been such as to discourage the hope that it may be capable of still further development.

Cases of diffuse redness, where a few of the smaller vessels stand out prominently, are much more amenable to treatment, although even here I have been sometimes disappointed. As a rule, the more prominent vessels may be made to disappear by inserting the needle in several parts of their course, and in this manner the affection may become much less pronounced.

The severer grades of rosacea, complicated usually with acne, are proper subjects for this treatment and often may be permanently benefited. The reserve that has been expressed with regard to the treatment of the milder forms must be repeated here. Many cases are somewhat improved, some are greatly improved, and a considerable number prove refractory.

In the case of port-wine mark much was expected of this method when introduced, but the results have been on the whole disappointing. In my own experience, an improvement was often seen that did not prove to be permanent. In cases where isolated vessels or irregularities of surface are present, the appearance of the whole may be much improved by destroying these excrescences. But in this condition we have, as a rule, to deal with a dense anastomosis of vessels of small calibre, which are so closely intertwined that the separate vessels cannot be seen, and, furthermore, there is often a dilatation of the deeper plexus as well. Fox of New York has proposed to create numerous minute cicatrices upon the surface of the patch with the electric needle, by which means the color would be so reduced that there would be no contrast with the surrounding skin, while the usual appearance of scar tissue would not be produced. It may sometimes happen that a deep brown pigmentation is left at the site where the punctures have been made, but this is gradually absorbed, and the skin becomes white after a while.

It is often more desirable to lighten the color of a patch rather than to turn it into a dead white, as the cosmetic effect may be better. It must be decided in the individual case whether a smooth white cicatrix is likely to be more or less disfiguring than the lesion itself, and in obstinate cases it may sometimes be decided that a scar would be preferable to the existing deformity. Sometimes when a mark has apparently been entirely effaced, dots of telangiectasis may reappear, scattered over the surface, and these must be again removed. The method by linear scarification may with advantage be combined with electrolysis in some cases. If a large surface is treated, antiseptic precautions should be taken.

The treatment of the larger vascular growths, the cavernous tumors, etc., belongs properly to surgery and may be found in the literature pertaining to that branch.

Angioma Serpiginosum.

This rare form of skin disease was first described by Jonathan Hutchinson under the name of infective angioma or nævus lupus. Three other cases have been reported in Europe by Jamieson, Waren Tay, and Lassar. The only case reported in America, so far as I know, is that by White in 1894. This latter case was also seen by me and was studied for a considerable period.

The disease begins as small, bright-red papules, firmly seated in the skin, like Cayenne pepper grains. The papules increase slowly in size until, as in White's case, they attain the size of a pea, when they undergo a spontaneous involution in the centre, the margin continuing to spread peripherally, and thus forming annular and circinate figures. New points are continually developing a little beyond the patches, and these have been called "infective satellites" by Hutchinson. The infective satellites in turn enlarge and undergo a central involution, and thus other rings are formed, which may join with the original ones and form gyrate figures. The central involuted portion is not, in the reported cases, atrophic. In White's case it was the seat of a dull-brown pigmentation.

In Hutchinson's case the lesions began on the back of the arm and spread upwards to the shoulder and downwards to below the elbow. Jamieson's case began on the extensor surface of the right arm, extending over the front and back of the arm and forearm, and downwards to the base of the thumb and forefinger, and there were some foci along the lower border of the fifth rib. In Lassar's case, the lesions first appeared on the cheeks, extending to the ears and right arm. In Tay's case both the legs were affected, the point of origin being the right calf.

White's case may be briefly summarized. The patient was a boy of twelve, of frail appearance, and of very nervous organization. According to his mother, a purple mark about half an inch in diameter, was observed at birth just below the right scapula. This slowly increased in size till he was four years old, when another small spot appeared near by which began to grow larger. Since then the lesions have slowly increased in size and number. When first seen, the part affected extended from the anterior edge of the right scapula about six inches forwards to the nipple, and was covered by about twenty-four lesions, varying in size from the head of a pin to patches two inches in diameter. Beginning as minute, bright-red, elevated dots, they slowly increased in size until they were one-eighth to one-sixth of an inch in diameter, and were raised above the surface from one-eighth

to one-twelfth of an inch. They then sank slowly down in the centre, while the elevated margin continued to spread peripherally in a regular annular form, until by coalescence with the margins of other lesions this symmetry was lost. The lesions were firm in consistence, and disappeared only partially under pressure. The centre of the patches presented a dull-purplish color. New lesions were continually appearing at a little distance from the older ones, which underwent the same process of involution and extension. A number of the lesions were at one time destroyed by the Paquelin cautery, leaving smooth cicatricial tissue. Later, however, the lesions appeared in the same way just beyond and closely bordering on the scar tissue. A peculiar feature of this case was the marked sensitiveness to the slightest pressure, and the boy also complained of some itching over the affected area. He was of so excitable and nervous a temperament, however, and was so much alarmed at the thought of medical examination, that less weight than usual is to be put upon these phenomena.

Of the five cases reported, three were in females and two in males. Four of them developed before the age of two years and in two only was there positive evidence of a preëxistent nævus.

A careful histological examination of White's case was made by Darier of the St. Louis Hospital, and also by Councilman and the writer. The microscopical reports agreed in their main features. The epidermis and the papillary layer of the corium were filled with groups of cells, of variable size, extending in their general arrangement parallel to the surface of the skin. The masses of cells had a longitudinal shape on the whole and were often spread out in long ribbon-like masses. The cell groups were seen under a high power to be made up of cells with large oval nuclei, surrounded by a small amount of protoplasm, and were arranged in small groups or clumps of a concentric form, with sometimes a lumen in the centre, showing their intimate connection with the vessels of the skin. There was also swelling and proliferation of the endothelial and perithelial cells of the vessels, both in the vicinity of and at a distance from the foci. A marked feature of the process was the presence of small granular masses here and there in the groups, and these were found to be produced by a degeneration of the cells, as every gradation between slightly granular, poorly staining cells to a total necrosis, could be traced. The process seemed to begin by a proliferation of the endothelium of the vessels, accompanied by a corresponding proliferation of the perithelium, and the clumps of cells were later on the seat of degenerative changes. The growth may be compared to an angiosarcoma, taking the histological appearances alone into consideration, and it may be regarded as due to some anomalous

congenital condition of the vessels. Darier considers that we have to do with an unusual form of sarcoma, not massed in a single tumor, but reticulated and infiltrated as a network, which follows the vessels of the skin, and that there is a tendency to form clusters of capillaries, approaching the characteristics of a true angioma. He therefore proposes the name, "sarcome angioplastique réticulé."

The number of reported cases of this affection is so small that little is known of the course and outcome. In both White's and Hutchinson's cases, there was a recurrence of the growth after cauterization; in White's case the disease process seemed to have jumped over the territory treated, to reappear just beyond the border of the scar in the sound skin, while in Hutchinson's there was a recurrence in the scar itself. From the pathological character of the growth the probability that there may be some future malignant changes is not a remote one, and the prognosis would seem to be on the whole unfavorable.

With regard to treatment, everything thus far tried has been unsuccessful, even thorough destruction by cauterization or excision failing to stop the extension of the growth peripherally, and a recurrence sometimes takes place in the scar tissue caused by the operation. Crocker recommends the trial of electrolysis along the border of the affected area, so as to cause occlusion of the vessels along the spreading edge. But the results of cauterization do not encourage the belief that any other method of destruction would be more successful.

Angiokeratoma.

This affection, which is very rare, has been also called lymphangiectasis, telangiectatic warts, etc., and is characterized by warty growths, which appear over dilated vessels, in persons who are subject to chilblains.

Wyndham Cottle was the first to describe the disease and Mibelli was the one to give it the name of angiokeratoma. Mibelli's case was in a girl of fourteen who had had the affection for some years. The lesions were situated on the dorsal surface of the fingers and toes, and consisted of small transparent tumors the size of a hempseed, of a dull or dark-red color, with a rough horny surface. There were no constitutional symptoms, but the child had suffered every winter from chilblains. The patient was seen frequently for a year and a half and there was no especial change in the lesions. The fingers were very cold in winter and the lesions were harder and of a darker color then than in the summer. The chilblains which came during the winter were independent of these lesions and had no influence on

them. The first appearances were small red, telangiectatic spots which quickly became covered with a horny, warty epidermis.

In all the recorded cases, the patients have been subject to repeated attacks of chilblains, and while the attack of chilblains is subsiding these small telangiectatic spots make their appearance. These persist, and by their confluence with others form a papular elevation, while at the same time a warty growth appears on the surface. There is no tendency to spontaneous involution. These lesions are always found on the dorsal surface of the fingers and toes, and, in one case only, on the ears. They may also rarely be found on the palms and soles. The tumors are not painful nor subject to any abnormal sensations. They are usually worse and increase more rapidly during the cold weather, and they sometimes bleed rather freely.

In most cases females have been affected, and in all cases the patients are young. Successive attacks of chilblains are always an accompaniment of, or precede, the eruptions.

Histological examinations have been made by Colcott Fox, Pringle, and Mibelli. The epidermis is found to be greatly thickened in all its layers, stratum corneum, stratum lucidum, and rete being affected. In the rete are found large cyst-like spaces filled with blood. In the papillary layer of the corium the papillary vessels are greatly dilated, or replaced by a broad vertical opening filled with red corpuscles. Later on many of the papillæ show large cavernous spaces, divided by septa and filled with blood. Hence the name angiokeratoma is justified, as we have a tumor made up of cavernous or angiomatous tissue, to which is added an hypertrophy of the epidermis in the form of a keratoma.

The *diagnosis* of keratoma may at first sight be suggested; but the peculiar color of the nodules, the angiomatous base that is present, their development from telangiectatic spots, and their association with chilblains point conclusively to their real nature.

As regards *prognosis*, the nodules are quite persistent and tend to increase in number. Spontaneous involution is very rare.

Treatment.—Pringle treated the lesions successfully by means of electrolysis, passing a current of three milliampères into them by means of the electric needle. The measures that are recommended for the prevention and cure of chilblains should be rigorously carried out.

Lymphangioma.

Properly speaking, lymphangioma is a tumor made up of newly formed lymph vessels. But it is a matter of so great difficulty oftentimes to determine whether the vessels that are seen are really new

growths, or only dilatations of previously existing vessels, that it is impossible in the present state of our knowledge to draw a very sharp line of distinction between the two processes. Undoubtedly dilatation is often combined with a new growth, as is especially noticeable in lymphangioma circumscriptum, the most important member of the group under consideration.

Lymphangiectases may, however, occur alone in cases where there is no question of a new formation of vessels. They are usually found in the form of multiple lesions and may affect the superficial or the deep lymphatics. When they are superficial, they appear as grouped or isolated vesicles, of the normal color of the skin, which exude a lymphatic fluid when broken, and disappear on compression. Lymphangiectases of the deeper vessels may be perceived only on deep pressure. It is often impossible to determine the cause of these dilatations. Often it is an irritating agent, of either parasitic, septic, syphilitic, tuberculous, or cancerous origin. Besnier has described an acute form of lymphangiectasis which is illustrated by a case occurring in a man of twenty-six, following a contusion of the penis. Eight days after the injury vesicles developed on the penis and scrotum, and there was much œdema of the penis. A much more common form is the chronic lymphangiectasis. This occurs usually upon the lower limbs, its course is slow and remittent, and secondary lesions of subcutaneous tissues, of periosteum, and of bone may occur. The skin lesions take the form of nodules, with a soft centre, from which lymphatic fluid may flow and lymphatic fistulæ may result. They are often arranged in rows following the course of the vessels. Sometimes they are caused by traumatism or by irritants; in other cases they are associated with tuberculosis. The skin of the affected region is indurated and œdematous, sometimes cicatricial. Chronic lymphangiectases are also produced by the pressure of tumors, or by anything which causes an obstruction to the circulation of the lymph, such as parasites and micro-organisms.

Wegner's division of the lymphangiomata has been adopted by Besnier, and seems the most simple and practical of the many classifications of this subject that have been proposed. He divides them into the *simple*, *cavernous*, and *cystic* varieties.

Simple lymphangiomata are tumors made up of enlarged lymphatic vessels which are in part new formations and in part a dilatation of preëxisting vessels. They may be found upon almost any part of the body, but they are more often seen on the penis and scrotum, the labia majora, the tongue, lips, and cheeks. There is often an œdema and thickening of the skin accompanying these tumors, and hence the name elephantiasis has been applied to them.

When situated upon the tongue they cause the condition termed macroglossia, while those upon the lips have been named macrochilia. They have also been seen upon the conjunctiva. They may be either circumscribed or diffuse, and occasionally a connection with enlarged lymph channels may be traced. Sometimes perforation occurs and lymphatic fistulæ, from which a clear serum exudes, are formed. Upon their surface or in their vicinity there are sometimes a number of transparent vesicles from which a clear or milky fluid exudes when they are broken. In a case seen by the writer, a boy of eighteen presented upon the inner side of the thigh a large, easily compressible tumor, which was surrounded and covered by small vesicles. When these vesicles were punctured, a milky fluid continued to exude for a long time, after which the large tumor diminished greatly in size, but attained its former dimensions in a short time.

Cystic lymphangioma is preëminently a surgical affection, and requires but a few words here. It occurs as a rule in the neck, although it may be found in other regions. The tumors are seated in the upper part of the neck and may send prolongations in between the muscles, even as far as the mediastinum. They are usually congenital.

Cavernous lymphangioma includes the affection that has been called *lymphangioma circumscriptum*, and is the form of lymphangioma possessing most interest to the dermatologist.

Lymphangioma Circumscriptum.

This affection is characterized primarily by small vesicles deeply seated in the skin, which have been compared to frogs' spawn. They are usually found closely aggregated in clusters, which have an irregular distribution, with healthy skin between the various groups. In some cases these clusters have a circular form; in others they are arranged in bands, which in certain instances follow the course of the nerves apparently, although there is no evidence of any implication of the nervous system in the etiology. Sometimes again the lesions are distributed over the large lymphatic vessels. There are apt to be one or more patches larger than the rest, surrounded by smaller lesions, which in turn coalesce and form groups. In twenty-eight cases collected by Francis, the lesions were found to occur most frequently upon the upper parts of the extremities. The scapular and axillary regions have been frequently affected, although, owing to the rarity of the disease, little stress should be laid on this fact. In a very large percentage of the reported cases the affection was seated on the left side of the body.

These vesicles are deeply seated and of small size, varying from that of a pin's head to that of a small pea. The epidermis covering them is always firm, and often undergoes a warty change, so that many of the groups or individual lesions may give at first sight the impression of warts. In some instances this hypertrophy of the epidermal covering becomes very marked, so that long warty projections may appear. An implication of the blood-vessels is usually aparent, and in some instances this is more marked than the affec-p tion of the lymphatics. The vesicles are often traversed by small telangiectases, or they may be covered with vascular dots, and these appearances may almost wholly obscure the vesicles. Thrombosis may occur in these capillary blood-vessels, and there is sometimes hemorrhage into the vesicles. The degree in which the blood-vessels are implicated varies much in different cases. If the vesicles are not obscured by the warty change upon their surface, or by the presence of dilated or newly formed vessels, they have the color of the normal skin, or may be faintly yellow. When pricked, a clear, colorless fluid exudes.

A very interesting feature sometimes present in circumscribed lymphangioma is that of recurrent attacks of inflammation about the lesions, which are of an erysipelatous type and have sometimes indeed been called erysipelas. In a case seen by the writer a man thirty-two years of age presented a large surface upon the left thorax and upper arm covered with lymphangiomatous vesicles and warty projections. He was subject to frequent attacks of inflammation, when the patches became greatly reddened and swollen, as did also a large extent of the skin in the vicinity. These attacks were almost invariably associated with some constitutional disturbance, such as malaise and nausea, and frequently occurred as often as once a month, although sometimes he was free from them for several months. These attacks lasted for a few days usually. At the time of their occurrence there was great sensitiveness of the skin of the affected area, and much pain on motion of the arm. Besnier points out the resemblance of these attacks to the "elephantoid fever" and "erysipelas" that occur in elephantiasis in recurrent outbreaks. Just what the nature of this inflammation is, we do not know. It resembles erysipelas quite strongly in some respects, but differs from it in being limited in great measure to the affected part, and never, so far as is known, spreading to other parts of the body. It is not known whether this inflammation is the cause of the new formation and dilatation of the lymphatic vessels, or whether it is a symptom of that process. These inflammatory attacks, moreover, are sometimes associated with the other forms of lymphangioma. In some cases they

have preceded the appearance of the vesicular lesions, and have caused an increase in the size of the latter; in other cases they have no apparent effect upon the process.

Nearly all the cases have begun in infancy or in early childhood, and it is extremely probable that the disease is due to some embryonic defect, that asserts itself after birth by the growth of the lymphatic vessels. The course of the disease is extremely slow, and often it remains almost stationary for years. There is a record of spontaneous involution in only one case, which is remarkable in view of the frequency with which new vascular formations disappear of themselves. In many of the cases there is an increase of fibrous tissue in and about the affected area, which may be of slight extent, and amount to a simple infiltration, or may be so extensive as to deserve the name of local elephantiasis. This condition is sometimes seen in all varieties of lymphangioma, and is to be regarded as secondary to the neoplastic and inflammatory processes.

Etiology.

Of twenty-six cases collected by Francis where the sex was mentioned, fourteen were in females and twelve in males. With regard to the time when the disease first appears, in almost all instances it is either congenital or is first noticed in infancy or in childhood. In one or two cases it has begun in adult life. In several instances the growths have been associated with venous nævi, and it is most probable, as has been said, that they are all of congenital origin. Irritation and injury have been thought to play a prominent part in the disease, as it has been said to be more frequent on the exposed portions of the body. Also surgical interference has in several instances led to an increase in the number of lesions. Crocker reports a case in which the disease was not noticed until the age of thirteen, when the vesicular lesions appeared on or near some scars which had been caused by the removal of a congenital tumor in infancy. It was stated that this congenital tumor was unlike the present affection. In one of Hutchinson's cases the disease appeared in the scar tissue caused by the excision of a port-wine stain in the right upper mammary region near the axilla. When the vesicular lesions were treated with the acid nitrate of mercury they showed a strong tendency to recur during the next six weeks. Similar phenomena have occurred after removal of the tongue for macroglossia. Francis has seen in these cases a rapid enlargement and an outbreak of lymphatic vesicles after electrolysis and after excision of a portion of the tongue. It has been pointed out that almost all the cases of this disease have been described by British writers, but as they were the first to call atten-

tion to it, and as cases have of late been coming in from German and American sources, it is doubtful if much significance should be attached to this fact. Hutchinson, who described some of the first cases, considered that the disease was a form of lupus, and gave it the name of lupus lymphaticus. But there is absolutely no reason for considering the affection as in any way allied to tuberculosis, or to any of its varieties, such as lupus, and the retention of the name lupus lymphaticus would tend to produce great confusion.

Anatomy.

In a lesion removed by the writer from the arm, which did not exibit any telangiectatic points upon its surface, nor fibrous nor warty complication, the following histological changes were observed: The chief feature was a collection of chambers or cysts lying in the upper part of the corium, and approaching very near to the epidermis, without, however, implicating it. These chambers or cysts were filled with an occasional leucocyte and some masses of fibrin. In many of the lesions the contents of the cavities had escaped during the preparation or manipulation. The cavities were often divided into several subdivisions by septa formed of the unaltered corium. A well-marked layer of cells could be traced, forming an endothelial lining of the cavities. Some of these cells were rounded and full; others were of a spindle shape or slightly flattened. There could be no doubt that these cavities were newly formed or dilated lymph vessels and spaces, and this was proved conclusively by the fact that they could be seen to communicate with smaller, more regular channels below, which were evidently a part of the lymphatic system. There were considerable collections of round cells about these dilated or hypertrophied lymphatic vessels and spaces, but none in other parts of the corium. In the lesion examined but few enlarged blood-vessels could be seen. Those that existed were usually situated in the corium below or at the side of the lesion, none above it. The epidermis was thinned over the lesion, the lower rete cells being flattened and compressed. The papillæ had disappeared in great measure. At the borders of the lesion, however, the interpapillary epithelial prolongations were considerably lengthened.

This description accords pretty well with those that have been given by other investigators. The implication of the blood-vessels in the process seems to vary much in different cases, and in different lesions in the same case. In the lesion which has been described above there were very few enlarged blood-vessels, but care was taken to select a lesion in which the telangiectases and vascular dots were but slightly apparent clinically. Besnier has raised the objection

that in some of the cases reported the lymphangiomatous character has not been demonstrated, and that they probably belong among the hæmatangiomata. There can be little doubt that there is much variation in the degree to which the blood-vessels proper are affected, and that there are all gradations, from cases in which the lymph vessels alone are affected to those in which the hæmatangiomatous element is exceedingly pronounced. In these latter cases it has been found that the corium contains numerous dilated blood-vessels, together with the enlarged lymphatics, and that the telangiectases and vascular dots that have been referred to are caused by the presence of dilated capillary blood-vessels between the upper wall of the cysts and the epidermis. Sometimes these dilated vessels are in communication with the cysts, and in this case the contents of the latter are found to be mingled with blood. It is very difficult to determine just what part is played by newly formed lymphatics and what by the dilatation of preëxisting lymphatics, but it is now pretty well agreed that there is a distinct hyperplasia of these vessels.

Diagnosis.

Lymphangioma circumscriptum may usually be diagnosticated by its commencement in early life, by its groups of thick-walled vesicles, with often secondary warty changes and telangiectases upon their surface, by its slow course, and by the discharge of lymph when the lesions are incised. It may resemble closely an aggregation of warts at first sight, but the above characteristics will distinguish it from them on closer inspection.

Prognosis.

Spontaneous involution has occurred, so far as is known, in but one case of lymphangioma circumscriptum. As a rule, the lesions increase slowly, but often remain stationary, or nearly so, when a certain development has been reached. In all classes of lymphangiomata, the growths are very likely to reappear after operative interference. The necessity of strict antiseptic precautions should be borne in mind when operating upon any lymphatic growth, as the lymph channels offer a favorable territory for the transmission of septic material.

Treatment.

Internal treatment is of no avail in this class of cases, except in so far as general tonics and hygienic measures may be indicated to combat the anæmia caused by the loss of lymph. The forms of sim-

ple and cystic lymphangiomata require external treatment that must be regulated according to general surgical principles. Lymphangioma circumscriptum may be treated by means of excision or of caustics. The thermo-cautery and the galvano-cautery will, however, usually be found preferable. Recurrence after operation is not unusual. In a case of Crocker's, in which caustics had been used a year previously, numerous fresh lesions had appeared in and around the scars caused by the operation. The same results followed the employment of electrolysis. Crocker is inclined to think, however, that unless a very radical excision can be performed, electrolysis offers the most hope of success. Each vesicle should be transfixed by the needle attached to the negative pole of the galvanic battery, and eight or ten cells may be used. The difficulty in treating this class of growths probably arises from the fact that there are deep anastomosing vessels, subject to proliferation, which it may be impossible to reach.

LUPUS ERYTHEMATOSUS.

In 1851 Cazenave proposed the name of lupus erythematosus for the disease that we are about to consider, using the name lupus because this process, as well as lupus vulgaris, which is a form of cutaneous tuberculosis, healed only with the formation of cicatricial tissue. The adjective erythematosus is well chosen, as expressing a distinct characteristic of the process. Now that we know that lupus vulgaris is simply one form of tuberculosis of the skin, much confusion is created by the application of the word lupus to an entirely different disorder. It should be mentioned, however, that there are still a few dermatologists, notably Besnier, who regard lupus erythematosus as a form of cutaneous tuberculosis, and in their eyes, therefore, the clinical name of lupus is well justified, inasmuch as lupus vulgaris and lupus erythematosus have the same etiology. This question, although in my own mind settled, will be discussed later on in deference to the opinions of Besnier and the minority.

Previous to Cazenave, Biett had described the affection under the name of erythema centrifugum. Hebra a little later suggested seborrhœa congestiva for a condition which may precede and develop into a lupus erythematosus; later on he accepted the latter name, as proposed by Cazenave, for the whole process. Other names that have been suggested are erythema lupinosum, lupus seborrhagicus, herpès crétacé, lupus acnéique, and lupus acneiformis. Quite recently the list has been further added to by Unna's proposal to call it ulerythema centrifugum, a name which he has himself already adopted, the deri-

vation being from οὐλή, cicatrix, and ἐρύθημα, erythema. The class in which this affection properly belongs has been a matter of much dispute, and the pathological studies that have been made do not settle the question quite definitely. Kaposi places it under the cutaneous atrophies, taking the ground that, although it consists essentially in an inflammation of the skin, with its point of origin in different layers and regions of the corium and subcutaneous tissue, yet the characteristic feature of the process is its regular termination in a form of atrophy of the skin. To this view it may with reason be objected that the final stage of a process can hardly be taken as its most characteristic feature, inasmuch as cicatricial tissue is the result of so many different affections, such as tuberculosis, syphilis, etc. It is also true that the resulting cicatricial tissue may be very slight or even wanting. While the pathology of the affection is so little understood, its resemblance, both clinically and anatomically, to other members of the group of affections classed as new growths is so striking that it seems most rational to include it under this heading.

Symptoms.

The first appearances of lupus erythematosus are in the form of one or of several slightly elevated spots, from the size of a pinhead to that of a bean, and of a bright-red color. They average about one-eighth of an inch in diameter, and their centre is covered with a small, firmly adherent scale, of a fatty, sebaceous character. If this scale is raised, it will usually be found to dip down in places into the enlarged mouth of a sebaceous gland; or the centre may at the outset show a slight cicatricial atrophy. When the simple papule covered with a sebaceous crust and without as yet a central atrophy is present, we have to do with the stage that was named by Hebra, seborrhœa congestiva, and which may persist for months or years without developing into true lupus erythematosus. These spots increase slowly in size, and have a very chronic course. Their growth is effected by centrifugal extension of the bright-red, raised, erythematous border of the lesion, and this sharply defined border is a marked characteristic of the process. This erythematous border is of firm consistency. While it is extending peripherally, the centre of the lesion is undergoing a process of involution, for it gradually sinks down more and more and the skin appears atrophied and shrunken, leaving a thin, white scar tissue, surrounded by the raised, erythematous edge.

One of the most prominent features of the process is an enlargement and alteration in the mouths of the sebaceous glands. The follicular orifices are very much distended and filled with hard sebaceous

matter, and the scales which often cover the central part of the lesion may be seen to dip down into these openings. Oftentimes these appearances are seen on or near the erythematous border, and its surface may appear to be studded over with comedones.

The spots increase very gradually in size, and may coalesce so as to form larger, more irregular patches, which continue to progress in the same manner, by a peripheral extension of the raised erythematous border, while the centre becomes atrophied and depressed. The patches usually increase up to a certain point, where they remain stationary for a variable time, perhaps years. Involution may take place at any time, however, when the first sign of the disappearance of the lesions is a diminution in color and prominence of the erythematous margin. The erythematous halo at the margin gradually fades out, then the raised border gradually sinks down to the level of the normal skin, while the centre remains as a permanent cicatrix, usually of slight degree unless the process has been an especially severe one. If the involution is not complete the centre may remain slightly reddened and covered with scales.

As to arrangement, there may be a certain symmetry maintained, or the lesions may be quite irregular. Where the patches run together, circinate and gyrate forms are often produced, but these forms do not usually extend very far. A favorite seat of lupus erythematosus is the nose and cheeks, and here there is often a marked symmetry observed. Patches may appear on the cheeks and sides of the nose, and gradually enlarge and progress towards one another until they meet upon the dorsum of the nose. This is the well-known "butterfly" form, so named by Hebra, where the part of the disease that extends out upon the cheeks represents the wings, and the point where the two lateral portions meet upon the dorsum of the nose the body. It is not uncommon to find the disease upon the ears, and there may at the same time be a butterfly form on the cheeks and nose. When situated upon the ears, it often simulates chilblains quite closely. It is sometimes found on the lips in scattered patches, but it rarely attains a large size in this location. It is not infrequently met with on the scalp, rarely affecting this part alone, but usually in conjunction with lupus erythematosus of the face. It may be present in rather large patches, but usually, at least in the cases that the writer has seen, it is in the form of small areas of alopecia, in which the skin is glistening and atrophic. As a rule, the enlarged sebaceous outlets and comedo-like appearances may be seen on the scalp. An important characteristic is apt to be lacking upon the scalp, namely the raised erythematous edge that is so common upon the face. The absence of this feature renders the diagnosis

upon the scalp much more difficult. The alopecia in these cases is of course permanent. The affection may occur also upon the hands, either as solitary, discrete patches, or in the so-called disseminated form where it is present in multiple lesions. Hyde has collected thirty-five cases in which the lesions were on the hands, and comments on the rarity of such descriptions in German and American literature. The English have recorded a larger number of cases in which the affection occurred on the hands than have writers of any other nation, and they speak of the similarity of these lesions to chilblains. Hyde found from a study of all the cases he could collect that of twenty cases of lupus erythematosus in which the hands were involved, the face was affected first in twelve patients, the hands in four, the fingers in three, and the forearm in one. There can be little doubt that many cases were formerly called lupus erythematosus that have since been proved to be forms of verrucous tuberculosis, an affection that is not uncommon on the hands.

Lupus erythematosus has been divided into various clinical varieties by different authorities. Kaposi recognizes a discoid and a disseminated form. The discoid form is by far the more commonly met with, and corresponds to that which we have just described. The disseminated form begins on the face with the development of a large number of lesions, and spreads by multiplication of the patches and not by extension of the individual ones. Some of the patches may indeed disappear, while others persist for a long time without change. They appear in the form of nodules as large as a pea and larger, are of a dark-brown color, covered with dilated vessels, and usually show a centre cicatricially depressed with dilated follicular orifices about it. These nodules are said to resemble syphilis, lupus, or leprosy very much. On the ears and fingers they assume large forms, and may be compared somewhat to chilblains. A large number of lesions make their appearance, which may cover large areas of the skin. In such a case not only the face, scalp, lips, and ears are affected, but many lesions may be found on the trunk, on the upper arms, and on the anterior and posterior aspects of the fingers and toes. They may be quickly or slowly developed. Sometimes an acute febrile eruption, accompanied by articular pain, pains in the bones, and nocturnal headache is met with. In some instances an intense erysipelatous inflammation of the face has appeared and remained localized at this point, being accompanied by a high fever and a typhoid state. Kaposi has named this erysipelas perstans faciei. In one-half of the cases there was a fatal termination. Sometimes small hemorrhagic or clear vesicles were seen on different parts of the skin, which dried and formed a crust under which the characteristic lesions

of lupus erythematosus were found. This acute form is considered a special variety of lupus erythematosus, and rarely accompanies the discoid form.

The views of the French school of dermatologists are entitled to so much respect on account of the great contributions they have made to their specialty during the last twenty years, that the division of this subject by Besnier must be referred to. He recognizes essentially two types of lupus erythematosus, a *vascular* or *erythematous* type and a *follicular* type. The vascular type is represented by spots and plaques of a reddish or deep-red color, which partially disappear on pressure; they are sometimes covered with telangiectases and are sometimes hemorrhagic. They are slightly raised, and leave a superficial imprint on pressure. The plaques are punctate, nummular, and diffuse, with pretty well-defined margins. The centre usually sinks down somewhat, exfoliates, and either regains its normal appearance or remains atrophied, at the same time that the edge pursues its centrifugal course (erythème centrifuge). These appearances are usually characteristic, but sometimes they may bear a close resemblance to those of chilblains or erythema multiforme.

The follicular type is exceptionally met with pure, without any hyperæmia except a small amount at the beginning. It is sometimes diffuse, but often forms plaques and confluent patches of greater or less regularity. Their surface is rough and dry, and covered with a grayish adherent exfoliation, which dips down into the follicular orifices, and exposes, when removed, a cribriform surface.

The vascular form is subdivided into three varieties—the simple, the exanthematoid, and the asphyxic. In the simple form the predominating feature is the erythema, as has been described above. The affection progresses slowly, and there is sometimes much infiltration of the corium. The mode of evolution, the chronicity, the peripheral extension with central atrophy, the desquamative type, the hyperæsthesia, the infiltration of the corium, and the alopecia are regarded as definite marks of differentiation.

The exanthematoid form is characterized by its symmetry, its dissemination, its faculty for partial or complete resolution, its subacute course, and by the variety of the lesions, which give it somewhat the character of an erythema multiforme. It may be localized or disseminated; in the former case, it occupies a small part of the centre of the face, as the bridge of the nose for example, or the ears, or the mastoid region; it is always symmetrical and the evolution of each lesion is rapid. In the disseminated variety, the lesions appear also upon the neck, the backs of the hands, etc. Besnier distinguishes several varieties of this form, one seen in young people,

relatively benign, and which may disappear without leaving any appreciable atrophy; another is peculiar to adults, of rare occurrence and sometimes acute, infectious, and malignant, resulting in pulmonary and renal tuberculosis; at other times it pursues a more chronic course, and is prolonged over a considerable period of time.

The asphyxic form is met with on the face and extremities, beginning usually upon the ears, then making its appearance on the bridge of the nose, the malar regions, and the backs of the hands. Its character upon the nose is erythematous, showing the follicular alterations; on the ears it resembles a livid indolent frost-bite, or cutaneous asphyxia; in place, however, of the ordinary central atrophy, foci of necrosis appear, which are followed by a complete loss of substance. The lesions upon the backs of the hands differ from those of the common variety only in their greater depth of color. These lesions all progress slowly, becoming darker and darker in color, and finally necrosis follows, as in the case of the ears. A fungous synovitis is a frequent accompaniment.

The follicular form is divided into lupus acnéique and lupus érythémato-folliculaire. Lupus acnéique is the form already described as the pure follicular variety. Lupus érythémato-folliculaire is the more common variety, in certain instances covering a large extent of surface. It has usually, however, sharply bounded plaques, which may be single or multiple, discrete or confluent, in the latter case forming large patches with a serpiginous border.

Brocq would also subdivide lupus erythematosus more than has been the custom. He thinks that two distinct types of disease have been confounded in France under the name of lupus erythematosus. The one, characterized by its special localization on the two cheeks, the bridge of the nose and the ears, in a word by its perfect symmetry, by its rapid extension and amelioration, he calls érythème centrifuge symétrique. This corresponds to Hebra's seborrhœa congestiva, and usually starts as small points no larger than a pin's head. This is the form that is apt to assume the butterfly shape. His other form, lupus érythémateux fixe, has a more indurated base, a slower evolution, and is very rebellious to treatment. He thinks that this form is probably due to an infection with the tubercle bacillus, and belongs in the same group with lupus vulgaris.

It will thus be seen that the views of the different authorities as to the classification of different forms of lupus erythematosus are not wholly in accord. It does not seem rational, or favorable to the future study of the subject, to make so many distinct varieties of this disease as does Besnier, whose clinical grouping is undoubtedly somewhat influenced by his belief in the tuberculous nature of the

disease. It is in the writer's opinion impossible to separate the different forms so sharply from one another. It is true that the amount of erythema varies much in different cases, and that the follicular enlargement and cretaceous covering may be more or less pronounced. These two characteristics are almost always found united to some degree, however, and there may be all sorts of gradations in their individual prominence. Nor can we accept Brocq's classification, as we do not believe that any of the cases that have the distinctive characteristics of this disease can be included among the tuberculous affections. In fact lupus erythematosus possesses, to a greater degree than most dermatoses, a distinct, specific, well-defined character of its own, and the cases ordinarily met with, although varying, as has been said, to a considerable degree in amount of erythema and follicular change, do not diverge widely enough from the common type to warrant so much stress being laid upon the varieties. The disseminated and malignant forms that have been described, especially by Kaposi, are of very rare occurrence—so rare that it may be a question whether in these cases we may not be dealing with a chance complication. The only cases that have been reported in America, which correspond definitely with the acute form, have been described by Hardaway. In one case the patient was a man twenty-three years of age, who, when first seen, was suffering from a dermatitis of the face caused by the application of chrysarobin to a lupus erythematosus of butterfly shape. The backs and palms of the hands and the dorsal and plantar surfaces of the feet were also the seat of thickened and scaling spots. Apart from deep boring pains in his limbs, he seemed well. A few months later, under the use of an irritating ointment, the face became swollen, the glands of the neck became much enlarged, and a high fever developed. Numerous dark-red spots appeared on the forehead, chin, and chest, and some pustular manifestations over the regions originally affected. He improved later and the temperature diminished somewhat, but did not return to normal, while the lupus erythematosus underwent complete involution. The enlargement of the glands, however, increased, and the patient finally died of an intercurrent pneumonia. Hardaway says that it is quite possible that the later manifestations bore no relation to the erythematous lupus, but that the case was interesting in connection with the graver form that had been described by Kaposi.

In the other case observed by Hardaway the patient was a girl of fourteen, who had upon the nose and cheeks a clearly defined lupus erythematosus of the butterfly form, together with some bright-yellow crusts. There were also isolated lesions of erythematous lupus

on the forehead, chin, and ears, as well as many upon the thorax. The eruption had appeared quite suddenly a short time previously. Soon afterward a high fever developed and the patient died, with symptoms of a general septic infection, the eruption having become more generalized. The submaxillary glands were somewhat swollen. No autopsy was permitted.

Lupus erythematosus may occur upon the mucous membranes in conjunction with the presence of the disease on the skin. Otherwise its diagnosis would offer great difficulties. It appears as plaques, covered with small punctate excoriations, of a red color, or spotted with grayish masses of exudation and superficial cicatrices. In a case under the writer's observation at the present time, the roof of the mouth is the seat of several plaques of the disease, showing cicatricial depression and red points scattered over its surface, which call to mind the follicular enlargements seen on the outer skin. In this case the face and ears are covered with numerous discrete and confluent patches, and the patient's intelligence is distinctly below the normal.

In most instances the course of the disease is extremely slow. It may attain a certain development and then remain stationary for many years. The exceptions to this are the cases that come under the heading of the acute type described by Kaposi and some of the French writers, and those of Hardaway. Much light is needed before these peculiar and exceptional cases can be fully understood. The termination of the process is an atrophy of the skin, but the scar that succeeds is usually superficial and in most instances not disfiguring in comparison with the original lesion. Some of the lesions, however, may disappear without leaving a perceptible scar. When there are patches of the disease on the scalp, there is a complete death of the hair, and small, slightly cicatricial areas of baldness are permanently left, which may simulate closely an alopecia areata.

Pathology.

The pathology of lupus erythematosus is still involved in much obscurity. The advances in microscopy of late years, while revealing many histological features that were not previously known, have not, it must be confessed, thrown much additional light upon the nature of the process. The possibility of the existence of an infectious element has stimulated many to an attempt to discover the presence of micro-organisms, but thus far none have been demonstrated, nor have attempted inoculations upon animals met with a better success. In default of any absolute conclusions, we must content ourselves for the present with a simple enumeration of the micro-

scopical appearances, with the hope that their bearing on the disease process may become more evident with time.

The chief seat of alteration is found to be the corium, and especially its upper third, the part bounded by the epidermis above and by the horizontal layer of blood-vessels below. It is filled with a dense infiltration of small round cells, which are by preference grouped along the course of the vessels. This infiltration varies somewhat in density and in extent, according to the type and age of the lesion. A more discrete infiltration is frequently found in the lower portions of the corium and in the subcutaneous tissue. The latest studies throw much doubt upon the opinion that was formerly held that the starting-point of the whole process is in the subcutaneous cellular tisue. The small round-celled infiltration shows nowhere a tendency to form groups or nodules, as is invariably the case in lupus vulgaris. The prominence of the infiltration at the level of the sebaceous glands (a point that has been especially emphasized by some writers) is regarded by Leloir as due to the fact that at these points there is an especially abundant vascular supply. The small cells that make up the infiltration have the character of embryonic cells, of which some may be the result of a proliferation of the fixed tissue elements, although the greater number are evidently a product of diapedesis. These cells are found to be continually undergoing a process of granular and fatty degeneration, which does not, as pointed out by Leloir, attack the cells en masse, and especially in the central part of the group, as in lupus vulgaris, but affects the cells individually and as if by hazard. No true giant cells are found in lupus erythematosus, contrary to what is observed in lupus vulgaris, where these cells are numerous and characteristic. In some parts of the sections, granular-fatty and colloid masses are seen, formed by the fusion of two or more cells. As soon as the infiltration of small embryonic cells has begun to appear in the tissues, a large number of them undergo granular-fatty or colloid degeneration, which ends in their absorption and disappearance, while at the same time a fresh infiltration of similar cells is taking place. The bundles of connective tissue in the area of infiltration are also progressively destroyed, sometimes in circumscribed areas, sometimes in a more diffuse fashion.

The walls of many of the cutaneous blood-vessels are seen to be undergoing a proliferation at certain points, and in some of them an obliterating endarteritis may be observed. Many of the vessels are much dilated and filled with red globules, and hemorrhages, either diffuse or in isolated foci, are often seen especially in the upper layers of the corium.

The sebaceous glands are at the outset of the process found to be

hypertrophied, and to be affected with hypersecretion. Later on they become involved in the cell infiltration, become fatty degenerated and may disappear entirely, although as a rule the process does not extend to this stage, and the glands are left hypertrophied and filled with dried epidermal cells and altered sebaceous matter. The excretory outlets of the sudoriparous glands also become affected, and undergo a fatty degeneration which results in their disappearance.

In the epidermal layers the chief alteration is one of atrophy. The lower layers of the rete have been found to undergo at the outset a fatty or colloid degeneration, and this is especially true of the cells in the interpapillary prolongations. Later the rete becomes much thinned, and the interpapillary prolongations and the papillæ of the corium are so much lessened in size, that the line between epidermis and corium loses to a great extent its normal serrated appearance. The rete proper becomes atrophied and reduced to a few layers of cells. The granular layer and the stratum lucidum have usually totally disappeared, while the outer horny layer is much atrophied. Leloir, who has made the most careful investigations, and from whom we have quoted freely in the above description, declares that he has never seen in lupus erythematosus the "altération cavitaire" of the individual cells, which is characteristic of vesiculation and pustulation and is frequently seen in lupus vulgaris.

Anatomically, therefore, as far as present knowledge permits us to conclude, lupus erythematosus represents an inflammation followed by fatty and colloid degeneration of the infiltrated cells, which results in an atrophy. Schütz concludes that the first pathological appearances are about the vessels of the papillary layer of the corium, but that the glandular portion of the skin, and especially the sebaceous glands themselves, take a prominent part in the process, as their hypersecretion acts as an irritant which furthers the formation of the cellular infiltration.

Etiology.

The disease is much more common in women than in men, and it has been estimated that about two-thirds of all cases occur in persons of the female sex. It is never seen in the very young and is quite uncommon in children, although Kaposi records a case in a child of three years. It is essentially a disease of adults, chiefly between the ages of twenty and fifty, and it is very rare in old age. It has been said that uterine derangement, chlorosis, anæmia, and a feeble circulation predispose to this disorder, but in a very large proportion of the cases met with in America no signs of ill-health can be detected. Scarlatina and erysipelas have been said to be the starting-points in

some instances, also exposure to the sun's rays or to intense cold. People with light complexions have been said to be more subject to it than those with dark skin and hair. A condition of seborrhœa often precedes, and seems to be favorable to the development of the affection. While the general health of the persons afflicted is found good, as a rule, the mental condition is often not of the best. Oftentimes this is due to the extreme disfigurement and the constant worrying over the condition. It has seemed to the writer that there was a greater degree of sensitiveness displayed by persons affected with this disease than by those who had to bear even greater deformity from other cutaneous lesions. I have often met with cases of extreme melancholia in the subjects of this disease and in a number of instances the mind has become really affected. In one or two instances there seemed to be a congenital lack of mental development. These mental phenomena are rarely met with in cases of lupus vulgaris, where the deformity may be much greater than in the disease we are discussing.

The question of a relationship between lupus erythematosus and lupus vulgaris or tuberculosis of the skin, is one that has for many years excited much controversy, and while the large majority of authorities do not believe in such a relationship, it still has some eminent advocates. Besnier is the one who defends this doctrine with the most vigor and ability. He declares that lupus erythematosus is very often accompanied by persistent swelling of the glands and by renal and pulmonary tuberculosis. This is not only true of the rare, malignant variety, which has been described by Kaposi, Brocq, and Hardaway, but he declares that these complicating phenomena are often present in the ordinary chronic type which we frequently see. Besnier also declares that tuberculous affections of the joints are frequently found in cases of this disease. His experience has been so large and his clinical acumen is so great that his observations are entitled to all respect, although my own opinion and that of most dermatologists are decidedly opposed to his views. He asserts that a thorough examination of each case will find tuberculosis, either in the patient's family or among the people or animals with whom he has been in contact. This has not, however, been found to be the case by other observers; but Besnier's reply is that a careful examination with regard to this point has seldom been made, and that it was only after attention had been called to the subject that internal tuberculosis was found to be more common in connection with cutaneous tuberculosis than had been supposed. He remarks further that very few people affected with lupus erythematosus live to old age, or otherwise the scars resulting from it would be observed among old people.

It has also been asserted by the advocates of the tuberculous theory of this disease, that transitional forms between lupus vulgaris and lupus erythematosus frequently occur. Besnier says that there are cases in which it is not easy to say where the lupus erythematosus begins and the lupus vulgaris ends, and that a lupus erythematosus of the face is often accompanied by a true tuberculosis of the skin, such as lupus vulgaris, or by a verrucous tuberculosis upon other parts of the body.

We cannot, as has been said, agree to this doctrine. For us and for most dermatologists, lupus erythematosus is a well-defined disease of the skin, entirely distinct from lupus vulgaris, or from any other known condition. Nor have we met with the transitional forms upon which so much stress has been laid. There may be, it is true, cases where one may hesitate for a moment in deciding between the two affections, but as a rule the differential diagnosis is far more likely to lie between lupus erythematosus and some other affection than between lupus erythematosus and tuberculosis. We have never seen cases where lupus erythematosus proper was present coincidently with a tuberculosis on other parts of the integument. We are far from doubting that what we have not seen does occur, but these instances are so rare that the association may be satisfactorily explained on the supposition of the existence of two distinct affections at the same time. Anatomically, also, the two affections differ widely. In cutaneous tuberculosis proper, it has been shown that all the histological appearances common to tuberculosis in other situations are present, namely, a granulation tissue in nodular foci, made up of small round cells, epithelioid, and giant cells, which undergo a central necrosis, and in which tubercle bacilli, although sparse, may be demonstrated by a careful examination. In lupus erythematosus an entirely different histological structure is found, as we have shown above. Moreover, repeated attempts have failed to demonstrate the presence of the tubercle bacillus in lupus erythematosus, and the most careful inoculation experiments, as those of Leloir, have failed to produce tuberculosis in animals by the inoculation of bits of tissue from lupus erythematosus. Leloir's experiments are entitled to great weight on account of his previous experience in the experimental inoculation of lupus vulgaris.

Diagnosis.

Lupus erythematosus does not as a rule present any great difficulty of diagnosis to one who has had a fair amount of experience with the disease. Some points of resemblance that may occasionally lead to confusion exist in connection with tinea tricophytina, syphilis,

and some forms of eczema and psoriasis. Tinea tricophytina differs in the fact that it usually occurs in young subjects, that the microscope will demonstrate the presence of the tricophyton tonsurans, and that there are no central cicatrices or dilated sebaceous follicles. With regard to syphilis, it is only the discrete, orbicular type that can be mistaken for lupus erythematosus, and that may be distinguished by its more rapid onset and course, by the greater infiltration of the edges, and by the smaller amount of inflammation.

Discrete patches of eczema and psoriasis are somewhat similar at times to lupus erythematosus. But there is never any scarring or atrophy from these processes, nor do they present the raised, sharply bounded edge of lupus erythematosus.

Frost-bites on the fingers, hands, or face are often very perplexing. The absence of cicatrization in the centre, and of enlargement of the follicles, together with their course and their association with exposure to cold, serve to distinguish them.

Prognosis.

This is not unfavorable as a rule. The majority of all patients seen in America are in the enjoyment of average health, and with the exception of the mental depression caused by their disfigurement, present no symptoms of disease. The lesions are remarkably persistent oftentimes, and resist every mode of treatment. In other instances they may disappear rapidly, either spontaneously or as the result of treatment, or they may increase in size and numbers during a long period of time. They may, rarely, disappear without leaving any trace of their presence, but as a rule there is permanent scarring of the skin.

The prognosis for those who believe in the tuberculous nature is naturally not so favorable, as in every case there is a possibility of the dissemination of the poison. The acute disseminated form that has been referred to is reported to be often followed by fatal internal complications.

Treatment.

The treatment of lupus erythematosus is admitted by almost all dermatologists to be more uncertain in its results than that of most other affections of the skin. Sometimes a simple soothing application will cause great improvement, although it rarely removes the disease; at other times any one of a large number of stimulating remedies will cause the prompt disappearance of the lesions. Again, a large number of remedies may be tried in succession before one is

found that for some obscure reason seems adapted to the case; and lastly, remedy after remedy may be employed without appreciable effect on the disease. Unfortunately these latter instances are by no means uncommon.

Internal Treatment.

Treatment by internal remedies is on the whole unsatisfactory. A great deal of benefit, however, may be derived from a proper attention to hygiene and to the general health. It is of great importance in cases where there is a considerable amount of redness and hyperæmia to instruct the patient to avoid all causes that may tend to flush the face and thus add to the existing congestion. Extremes of heat and cold, such as standing over hot fires or exposing the face to the sharp winds of winter, are to be carefully avoided. Alcohol in all its forms and stimulating articles of food and drink generally are to be interdicted. The bowels should be carefully regulated, and any digestive or menstrual disturbances are to be treated in an appropriate way. Moderate, regular friction of the body, and massage may be of aid, as well as hot mustard foot baths.

A great deal of importance is attached by some authors to internal treatment in the cases which exhibit intense hyperæmia. Brocq recommends in these cases ergotin, quinine, belladonna, digitalis, and aconite. Arsenic has been recommended by Hutchinson and others, and a few rare cases are on record where it seems to have produced a cure without the aid of external measures. The iodide of starch is advocated by McCall Anderson, who has seen it beneficial in many cases and curative in some. Iodide of potassium and phosphorus have also been recommended, as well as iodoform (Besnier). Ichthyol was given by Crocker in five-minim doses in the form of a pill three times a day after meals, and it was thought that it reduced the hyperæmia somewhat. It is on the whole doubtful if any of these drugs have any particular influence on the disease. Cod-liver oil is frequently used and in cases where there is impairment of nutrition it is of undoubted utility. The same may be said of iron and tonics generally.

External Treatment.

Remedies that exert a stimulating action are on the whole of most effect in the local treatment. It is to be remembered, however, that in many cases, especially where there is much congestion, violent inflammation may arise if the treatment be too energetic at the outset. In these cases, the affected areas should be protected against extremes of heat and cold, and against irritation of any sort. Where

there is much inflammation, we should use soothing, antiphlogistic treatment, and this is effected by the application of indifferent powders of starch, talcum, bismuth, etc., or various soothing lotions of calamine and lead. Bland ointments, as cold cream, pastes of zinc oxide, starch, and vaseline, bismuth ointment, etc., may be used with advantage. When the severe inflammation, if present, has been allayed, it is well to begin the use of the various stimulating applications that have proved themselves to be of service in this disease, trying them one after another, and beginning preferably with the milder ones. Contractile collodion by means of its uniform pressure on the vessels has sometimes been of great service. Ichthyol preparations are warmly recommended by Unna, who uses his zinc ichthyol ointment gauze at night after the preliminary use of hot-water fomentations.

Sapo viridis is a remedy that has been most favorably spoken of for years, and some writers put it first on the list with the recommendation that it be tried before all else. The method of Hebra is as follows: The part is vigorously rubbed with the soap dissolved in alcohol, in the proportion of two parts of the soap to one of spirit, by means of a piece of flannel or lint, which removes the fatty masses and crusts and exposes the dilated follicular mouths. A slight inflammation is in this way set up, which is dressed with an indifferent ointment or paste until the resulting crust has fallen, when the treatment with the soap may be renewed. By repeating the soaping process the lesions may sometimes be removed in a few weeks. Another way of using the soap is to spread it thickly on a piece of flannel and bind it on the affected part, keeping it there until a certain amount of inflammation has been produced, when soothing applications are resorted to. This treatment is of especial value in parts where the skin is thin, as the eyelids for example. Preparations of tar may be combined with the soap with advantage. Oftentimes, however, the soap treatment will not be well borne, the lesions will progress or become highly inflamed, and in such cases its use should not be persisted in.

A great variety of more or less stimulating lotions, ointments, and pastes have been tried in lupus erythematosus and almost all of them are sometimes effectual. The simplest application, such as a mild sulphur ointment, will sometimes heal a lupus erythematosus that has been present for several years, while in other cases, clinically precisely similar, no effect whatever can be produced by the most varied remedies. As the treatment is so largely empirical, the only method to be pursued is to try these various substances one after another. Sometimes we obtain a good result from some remedy that

had been previously tried without the slightest success. As the process is of a superficial nature and the scar that results usually not pronounced, it is important not to employ any treatment that is likely to cause greater disfigurement than the original trouble.

Sulphur suspended in water or alcohol, or in the form of an ointment or paste made with lard or vaseline, is a remedy that is often of service. It may also be used in the form of the iodide of sulphur; or the sulphate of zinc, combined with the sulphuret of potassium, suspended in alcohol or water may be tried. A combination of sulphur and salicylic acid, five to ten per cent. of each in vaseline, lard, or lanolin, is also sometimes effective. Tar also may be used either as a ten-per-cent. ointment, or combined with sapo viridis and alcohol, as in Hebra's formula; or oleum rusci or cadini may be painted on with a brush. Tar and naphthol soaps are also used. In fact almost all of the methods of treatment in use for an ordinary acne of severe grade may be used at times with advantage in lupus erythematosus. Vleminckx's solution, if tried, should be used with great caution, as it may easily cause more irritation than is desirable.

Brocq considers the treatment by sapo viridis the most hopeful, and next to this places applications of salicylic and pyrogallic acids which he uses in the following proportion:

Salicylic acid,	1 gm.
Pyrogallic acid,	2 "
Vaseline,	20 "

Or these substances may be incorporated in collodion. Another favorite formula is the following:

Salicylic acid,	0.50 gm.
Lactic acid,	.30 "
Resorcin,	.75 "
Zinc oxide,	2.00 "
Vaseline,	17.00 "

This ointment may be used during the day at the same time that the treatment by sapo viridis is employed at night. This treatment is a very stimulating one, however, and frequently cannot be borne by the patient, and in the latter case recourse should be had for a time to soothing remedies.

Resorcin is another remedy that has had its advocates of late. It is used by Unna as a ten-per-cent. solution in collodion, beginning, however, with a much more diluted preparation, as it may occasionally act as a caustic when used in this strength. It may also be applied in alcoholic solution, or as a five- to ten-per-cent. ointment in lard or vaseline. Benzolin rubbed gently into the part may also be tried.

Hutchinson recommends that this application be followed by a mild ointment such as boric-acid ointment, or a five-per-cent. iodoform ointment. Crocker speaks well of this treatment, except in cases where there is much hyperæmia. The benzolin is to be used at night, and some soothing treatment, such as a lotion of calamine, applied during the day. If irritation is caused the benzolin should be omitted for a day or two.

Sodium ethylate is also recommended for the treatment of small patches. Veiel uses chloracetic acid as a superficial caustic applied by means of a glass rod. Unna's iodoform gutta-percha plaster muslin may also be used where the lesions cover only a small area. Other plasters may be of great service, such as a well-adjusted mercurial plaster, which will sometimes produce a complete cure, and is much prized by Kaposi. Other mercurial preparations may be mentioned as sometimes of service, such as white precipitate and calomel ointments, in from five- to ten-per-cent. strength, solutions of corrosive sublimate, etc.

As a rule, in the treatment of this disease it is best to begin with the milder remedies and lead up to the stronger. Crocker prefers to start with calomel lotion or collodion and to try in succession mercurial plaster, benzolin, and sapo viridis; if these prove insufficient, recourse is had to linear scarification. For our own part the sulphur preparations have so often stood us in good stead that we should never employ the stronger remedies until these had been tried.

With regard to the more radical methods, the strong chemical caustics, such as nitric, sulphuric, and chromic acids, and chloride of zinc, as well as arsenical pastes, have not stood the test of experience and are seldom used now. Lactic acid, however, painted on with a camel's-hair brush, has a slight superficial escharotic action and may often be employed with advantage. In the treatment of lupus erythematosus of the mucous membrane of the nose, eyes, pharynx, etc., lactic acid is of great value.

Scarification is used by some, especially in France. It is as a rule best suited to the more vascular types, and where the disease is superficial the incisions should not be deep. The method described in connection with rosacea is to be followed in the case of lupus erythematosus, *i.e.*, parallel cuts should be made in the skin from one-sixteenth to one-thirty-second of an inch apart, varying the direction of the incisions at each operation, so that the cuts of the second operation may run obliquely to those of the first. The incisions should, according to Vidal, extend in depth through the corium, without exceeding this limit. Much stress is laid on the details of this operation by the French, who declare that success depends chiefly

upon strict attention to minutiæ and to the after-treatment. This consists in the application of mercurial plasters, or, if these are not well borne, in the use of simple powders and soothing ointments. Scarification can of course seldom be used in lupus erythematosus of the scalp. Here the various stimulating applications and the continuous employment of lactic acid, after previous use of the curette, have proved most reliable. The thermo-cautery has been used, especially in the dry cutaneous forms, or where there is much thickening of the horny layer. Nitrate of silver or scarification may be used in conjunction with this method. Besnier rejects absolutely the thermo-cautery on account of the needless amount of destruction that it causes. He prefers the galvano-cautery, which he uses either by dotting with needles or by linear scarification. This method is said to be of great value where the lesions are on the exposed portion of the lips. The incisions should be extended well beyond the borders of the lesions, so as to prevent their spreading.

Curetting the lesions with the sharp spoon is another method that should be mentioned. The wounded surface should afterwards be dressed with antiseptic precautions. Nitrate of silver in stick form may be employed with advantage to regulate the formation of the cicatrix. Immediately after curetting, the wound may be cauterized with pure lactic acid.

Electrolysis is a method that has been recommended by some, but its claims to favor are not as yet very great. It is performed by passing a needle attached to the negative pole of a galvanic battery through the lesions in various ways. Much experimentation has been made with this method, but it has not fulfilled the anticipations that were raised when it was first introduced.

MOLLUSCUM CONTAGIOSUM.

This affection was first described under the name of molluscum contagiosum by Bateman. It corresponds to the acne varioliformis of Bazin, an affection quite different from the acne varioliformis of Hebra, to which the name is now properly applied. It has also been called molluscum sebaceum, molluscum sessile, and molluscum verrucosum.

It is characterized by small tumors from the size of a pin's head to that of a pea, often growing to a larger size, although on the average they do not exceed that of a pea. They are firm to the touch, of a pearly or waxy white appearance, and somewhat transparent; they are either embedded in the skin or more commonly project somewhat from its surface, and are attached to the skin by a broad base, or

they may be somewhat pedunculated. In form they are rounded at first, when they appear as very small nodules; gradually increasing in size, they become more flattened on top and the centre sinks in, so that a distinct umbilicated appearance, quite characteristic of the affection, is produced. When a little tumor is pressed between the thumb nails, a creamy semi-solid mass is forced out from the umbilicated centre. When the contents have been expressed the tumor becomes contracted, and disappears as a rule, but in some instances simple pressure is not sufficient to empty it, and a free incision is necessary before the cheesy matter can be squeezed out. In other cases it may be necessary to dissect out the membrane which encloses this matter. Sometimes the tumor may become soft, and, breaking down, may disappear spontaneously. The tumors as a rule grow very slowly, and having attained a certain size they remain stationary for a long time. As a rule they are unaccompanied by any inflammatory complications. If such occur, however, either from injury or other cause, they usually lead to the softening and breaking down of the tumor, and to its disappearance, with perhaps a slight resulting scar. There are no subjective symptoms unless an inflammation is added, nor are there any constitutional symptoms.

Molluscum contagiosum may appear as a single tumor or more commonly there are several present, and in some instances large numbers have been found over the surface of the body. As a rule, however, they are not found in large numbers. They do not tend to coalesce usually and their seats are the face and hands, the scalp, neck, and genitals. They may exceptionally, however, be discovered on almost any part of the body, the palms and soles being exempt. Next to the face and hands they are most common upon the genitals, and it is not very uncommon, upon stripping a patient for examination for some other trouble, to find one or more upon the penis, which have existed for a long time and of which little note has been taken. They are sometimes found in large numbers upon the scalp, as in a case of the writer's, where an elderly gentleman presented on the top of his bald head scores of small pinhead-sized lesions, intermingled with which were a considerable number of large well-developed molluscous tumors. Exceptionally they are found on the mucous membranes. They are most common in children and often occur, as will be seen, in several children of the same family. The umbilication in the centre has suggested the name acne varioliformis, which was applied to them by Bazin, although in no other respect do they resemble the lesions of variola.

A few instances are on record where these tumors have attained a very large size, and to these the name molluscum giganteum has been

applied. Thus in a case reported by Laache there was a single tumor, seated in the occipital region, which increased until it was as large as two fists. Crocker speaks of a form that he has seen on the back of the wrists and over the knuckles where there were masses of tumors from the size of a pin's head to that of a hempseed, and the larger ones were usually compound. They were of a violet color, owing to the presence of dilated vessels upon the surface. Microscopic examination of some excised bits of tissue showed that they were true mollusca contagiosa.

Etiology.

As has been said, the affection is found much more frequently in children than in adults. Females have been said to be more often affected than males. People who live in damp, dirty localities, under poor hygienic conditions, are most susceptible. Hutchinson believes that it is much more common in England than on the continent of Europe. It is certainly not a rarity in America, where examples are frequently seen in the dermatological clinics of the large cities.

Despite its name, it is only recently that there has been any unanimity of opinion with regard to the contagiousness of this affection. Of late, however, the evidence has accumulated so rapidly that there can be no doubt that it is transmitted from one individual to another. It has been shown by a large number of investigators of different countries that these tumors may make their appearance in great numbers and upon many individuals, in families, schools, or institutions in which one of the members has become affected. It is exceedingly common to find on questioning the mother that others of her children besides the one brought for examination have a similar trouble, and to be able to verify the statement upon examination. Mollusca have been found at the same time upon the face of the infant, and on the breast of the nurse. Its frequent seat upon the genitals also speaks in favor of the theory of contagiousness.

An instance has been related by Caillant where a child of seven, affected with the disease, entered a hospital, with the result that in the three succeeding months fourteen out of thirty other childen acquired the affection. The writer has seen in a children's asylum in Boston the affection spread from one centre until twenty or thirty of the inmates were affected. In an asylum in Sienna fifty-six children were found to be affected, while in three other asylums in the same city no case was observed. Allen and Mittendorf, as well as Stelwagon and Graham in America have also reported epidemics, and certainly no further evidence on this point can be demanded.

With regard to inoculation experiments, although many have proved failures, and although a high degree of contagiousness cannot be claimed, there are a number of instances on record where the disease was produced artificially by the inoculation of the contents of the tumors. Retzius, Haab, and Vidal have reported successful inoculations, but in their experiments there were some flaws which caused them to express themselves with some reserve, and which failed to gain them the adherence of the opponents of this theory. Pick's experiments, however, placed the question of contagion beyond doubt. He succeeded in producing typical mollusca contagiosa by inoculation of the contents of one of these tumors at nine out of twelve points of inoculation in two individuals. These individuals were a girl of nine suffering from lupus of the face and an eleven-year-old boy with prurigo. It was found that the process had a long stage of incubation, and that the first visible signs of the new growth did not appear until more than two months after the inoculation, while it was from three to four months before the growth attained the size of an average lesion.

It has been said that Turkish baths offer a favorable opportunity for the development of mollusca. Crocker relates three interesting cases where the contagion was probably acquired in this way. In one, numerous mollusca developed on the back of the neck, where it had been in contact with a wooden head-rest at the bath; in another, large numbers of lesions developed on the back of a lady who had lain on the felt-covered benches at the bath. The third case was that of a lady who took a Turkish bath every other day in her own house, and it was found that her son was the source of infection. The towels and gloves used in these baths have been suspected by Hutchinson to be the source of infection. He states that all of his male cases were accustomed to take the baths.

Pathology.

Sections through the centre of a lesion of molluscum contagiosum show it to be made up of a number of lobules, separated by fibrous partitions, which converge to a small central opening. The lower part of the lobules is made up of epithelial cells, which soon become altered and transformed as the centre is neared, until a homogeneous, yellowish mass is formed which may be pressed out from the central opening. The significance of these appearances has long been, and still is, the subject of much controversy. Kaposi and others have always maintained that the tumor was formed from an enlarged and altered sebaceous gland. Virchow was the first to advance the view

that the tumor was caused by a growth of the rete Malpighii, beginning probably in the hair follicles, and the name molluscum epitheliale was proposed. The view that the sebaceous glands are in any way involved in this process has been abundantly shown to be untenable, as there is no similarity between the contents of a sebaceous gland and the cellular structure of molluscum. Nor are any of the characteristic cells of a sebaceous gland to be found in molluscum.

The question, From what portion of the epidermis does the growth take its origin? is one that has been much discussed. Many still claim that the starting-point of the growth is the epithelium of the mouths of the follicles. Neisser, who has done the most work on this subject, never has seen any indications of the implication of the epithelium of the follicle in the process, although he admits that the possibility of such a starting-point cannot be denied. In all probability the growth is a true epithelioma, produced by a proliferation of the lower layers of the rete.

A further question that suggests itself is, What is the significance of the molluscum bodies, the cell-like structures that are found at the mouth of the lobule, and may be pressed out? Are they a peculiar form of cell degeneration, or are they, as has been ably argued, parasites? The theory of Bollinger, Neisser, Mansuroff, and Touton is that we have to do with parasites of the class of Sporozoa, and the group Coccidiæ. These coccidiæ are susceptible to no specific staining which would make them evident at a glance, as in the case of so many of the bacteria.

If a section through the centre of a lesion of molluscum contagiosum is examined, we find a growth of the epithelium, as has been said. In the lowest or peripheral layers the epithelial cells are practically unchanged. In the third or fourth row, however, we begin to see small, clear masses usually in the neighborhood of the nucleus. They are seen in well-prepared specimens to be small oval bodies, pointed at each end and provided with a small nucleus. Not all the epithelial cells, however, are thus affected; some of them remain normal, but compressed in the lower layers, so that sometimes the nucleus only is visible, while in the upper layers they are filled to an unusual extent with eleidin, and are transformed into horny scales. There are therefore two processes going on at the same time: a transformation of some of the epithelial cells into "molluscum corpuscles," on account of the presence in their substance of parasites, and an excessive cornification of the remaining cells.

In the further growth of the parasite it presses upon the nucleus, which is often pushed over to the extreme edge of the cell. As the parasite grows, it fills the whole interior of the epithelial cell as a

finely granular mass, with a clear transparent zone at its periphery. The granular mass is found on careful examination to be made up of very small bodies, closely aggregated. This is best seen, according to Neisser, in fresh preparations. These small bodies in a further stage group themselves together into oval masses, which soon become sharply bounded, glistening, isolated bodies. There now begins the period of degeneration, and the wall of the cell and the remains of the protoplasm begin to undergo a cornification which soon obscures the parasites in the interior. The "molluscum corpuscle" is now complete and consists of an epithelial cell filled with a parasitic growth that has undergone a process of cornification.

The opponents of this parasitic theory are of the opinion that the peculiar intra-cellular masses may be satisfactorily explained as the results of a colloid, hyaline, or some peculiar degeneration of the cell protoplasm. While not as yet proved, it seems highly probable from Neisser's investigations that these bodies are parasites. Virchow long ago pointed out the similarity of the molluscum corpuscles with the gregarinæ found in the visceral organs of rabbits. Bollinger referred to their similarity to the growths of epithelioma contagiosum found in fowls.

Unfortunately, all attempts to cultivate these bodies outside of the human organism have proved futile.

Diagnosis.

The characteristics of these little tumors are very well defined. It is almost impossible to confound them with other affections when we remember their size, their central depression, their firm consistence, their waxy, glistening appearance, and their favorite location upon the hands, face, and a few other parts of the body. Milium has some resemblance to molluscum contagiosum, but there is no umbilication and it rarely attains so great a size. Fibromata have been said to resemble mollusca somewhat, but the likeness is certainly not a strong one. Verrucæ may at times offer the most similarity, but usually can be excluded by the central depression that is almost constant in mollusca and never occurs in ordinary warts, by the greater papillomatous element in the latter, by the glistening appearance and rounded shape of mollusca, and by the fact that their contents may be expressed with the thumb nail. A microscopical examination of the contents will afford conclusive proof, as the molluscum bodies may be readily detected. If there is any remaining doubt, excision of a lesion and microscopic examination of a section will reveal the anatomical structure typical of molluscum.

Prognosis.

The prognosis is favorable, and oftentimes the tumors disappear spontaneously, their contents becoming softened and being finally thrown off. They are liable to no changes other than those produced by an inflammation which may affect them secondarily.

Treatment.

The lesions may usually be pressed out with the thumb nails, and do not as a rule recur. Some advise first incising the growth with a knife, as the expression is in that way more easily performed. In some lesions this preliminary incision is necessary, in others not. The interior may be cauterized with nitrate of silver, or some other caustic, but this is rarely necessary, as simple expression of the contents seems to remove the growth permanently. Where there are numerous lesions, or where for any reason it is not deemed wise to remove the growth surgically, ointments of salicylic acid and sulphur are often effective. Other methods that are effective, are scraping out the contents with a small curette, or in the case of pedunculated growths, snipping them off with the scissors. It should be remembered that the growths if left to themselves will often disappear without leaving a scar, and no treatment should be adopted that offers any chance of a disfigurement greater than that caused by the original lesion.

RHINOSCLEROMA.

This affection was first described by Hebra and Kaposi in 1870. They had seen at that time seven instances of the disease, a number that was more than doubled upon the appearance of their work on skin diseases. The affection is exceedingly rare outside of the Austrian empire and Russia and some parts of Central and South America. A few scattered cases have been reported from Italy, India, Egypt, etc. Notwithstanding the enormous number of cutaneous diseases that he has had an opportunity of studying, Besnier had never met with a case in Paris until 1883. He declares that the disease does not occur in natives of France, the few instances that have been recorded affecting people of foreign birth. In England only a few cases have been observed, and in most if not all of these the subjects were foreigners. Pollitzer has reported a case in New York, and this, too, was in a foreigner, a native of Galicia.

The affection, as its name implies, is situated chiefly on the nose

and in the neighboring regions. It has its origin as a rule on the mucous membrane of the nasal fossæ, or on the upper lip. It may, however, appear primarily in other organs, especially the larynx and pharynx, and in view of the fact that it may remain localized on these parts, Besnier's criticism of the name rhinoscleroma for the affection is not without force.

The lesions appear in the form of flat or somewhat elevated plaques, deeply embedded in the mucous membrane or skin, and sharply bounded from the adjacent surface. They are either discrete or coalesce with one another, and are characterized by their hardness to the touch, which has been compared by Hebra to that of ivory. The surface of the lesions is smooth, of a reddish color, destitute of glandular structures, and sometimes crossed by a few dilated blood-vessels. These plaques may in some instances be lifted up by the finger inserted beneath their base. They are movable only with the skin. They are somewhat painful when deep pressure is exerted.

The growth of these lesions is slow but continuous. The disease progresses from its starting-point on the alæ or mucous membrane of the nose, and, usually after the lapse of considerable time, causes the nose to become much broader. It is apt also to spread upwards into the nares, which become much narrowed and may be totally occluded. It may involve the gums, the posterior nares, and the palate, but this is usually at a late period of the disease. The uvula may entirely disappear and the palatal arch become adherent to the posterior pharyngeal wall. According to Kaposi, small superficial erosions may occur in the uvula and velum, which are not unlike syphilitic ulcers. They exhibit no signs of inflammation and are never deeply seated. Perforation of the palate has also occurred.

The disease has been known to extend to the larynx, and to cause stenosis of the glottis and symptoms of suffocation and aphonia. It may also attack these regions primarily. Tracheotomy has been necessary in some cases. Kaposi considers it probable that some cases of laryngeal stenosis that have been described under other names are in reality caused by rhinoscleroma in this region. The trachea, so far as is known, is rarely attacked, although an instance has been reported by Chiari.

The growth never breaks down spontaneously. When ulceration occurs it is usually due to pressure or to improper treatment. Small superficial excoriations, however, are sometimes observed. When cut into with the knife far less resistance is met with than would be supposed from the excessive hardness to the touch. When a piece is excised suppuration does not follow, but the loss of tissue is speedily repaired and the growth quickly attains its former size.

The disease appears to affect the two sexes about equally. In fifty cases observed by Kaposi, the ages of the patients were between fifteen and forty years. It does not seem to be more prevalent in one class of society than in another, and the general health is entirely uninfluenced by the growth.

ANATOMY.

It was formerly believed that the disease was syphilitic, but this has since been abundantly disproved by anatomical study and by the accumulation of clinical facts. Histologically the growth is composed of chronic inflammatory granulation tissue, and belongs in the same group with syphilis, tuberculosis, and leprosy. There is a dense infiltration of round cells seen under the microscope, together with certain peculiar cell forms that are more or less characteristic of the affection. Frisch was the first to discover the presence of bacilli in this granulation tissue, occurring either in groups or inclosed in cells. His results have been confirmed by a large number of observers, including Cornil and Alvarez, Paltauf, Payne, and in fact by all who have studied the disease of late years, as the bacilli are not very difficult to detect when proper methods of staining are employed. Cornil and Alvarez demonstrated a capsule about the bacillus, which is short, thick, of a coccus form, and stains only at the ends. Paltauf and Eiselsberg confirmed these observations and showed that the capsule was best brought out by staining with gentian violet and aniline water, and afterwards decolorizing with dilute acetic acid or an iodine solution. They also succeeded in obtaining pure cultures of a bacillus corresponding to that found in the tissues. They found a great similarity, both in morphological appearances and in the cultures, between these micro-organisms and the microbe of pneumonia described by Friedländer, the only difference being that the bacilli of rhinoscleroma appeared to be less virulent. They concluded that chorditis, rhinitis, ozæna, and rhinoscleroma were all due to the same infectious material, which produced many different clinical appearances according to the localization and intensity of the disease process. Paltauf, however, in a later communication declares his disbelief in the identity of the rhinoscleroma bacillus with that of Friedländer, although he regards them as nearly related.

Some of the most careful histological studies have been made by Mibelli, who considers that there are two kinds of large cells present in the granulation tissue, which have not been correctly described and interpreted. First, there are a great many very large cells with reticulated protoplasm and small nucleus, and, second, there is a smaller number of cells, not quite so large as the first, which contain

a highly refractive homogeneous substance. The cells of the first variety are stained with difficulty, or not at all, while those of the second variety are very deeply stained, especially by basic aniline coloring matter. The first often contain the bacilli of rhinoscleroma, while in the second these cannot be surely demonstrated. Some of these forms are those that have been described by Mikulicz and other writers under the name of dropsical cells, hyaline globes, etc. Mibelli's theory is that these changes are brought about, not by a hyaline, colloid, or other degeneration of the cell itself, but by the presence of zoöglœa, a substance of a mucous nature produced by the bacilli, and that in the first variety of cells, which he calls dropsical, a large amount of water has been absorbed by the zoöglœa, which makes the cell matter particularly soft and hard to stain. The second or colloid form, however, possesses the zoöglœa in a somewhat dried condition, which makes the cell harder and more receptive to staining fluids.

Diagnosis.

When the affection is seated upon the outer surface of the nose and adjacent parts, and has attained a considerable degree of development, the diagnosis is not difficult. Rhinoscleroma was formerly, as has been said, considered a manifestation of syphilis, and it presents in fact many points of resemblance with a gummatous lesion. It differs from it, however, in the total absence of softening or of ulceration, in the extreme hardness, and in its resistance to the action of antisyphilitic remedies. Its location also is of a certain value. Lupus and epithelioma may sometimes come into question but may be easily excluded by the characteristics of rhinoscleroma that have just been mentioned, together with their own peculiar features.

The diagnosis, when the disease is seated upon the mucous membranes alone, is much more difficult. Chiari and Riehl mention as distinguishing features the flattened and tubercular form, the great hardness, and the sharp boundary of the plaques. They are of a reddish-brown color and differ from syphilitic infiltrations in the absence of inflammation. Ulceration occasionally occurs in rhinoscleroma, but it is of a much more superficial character than in syphilis, has no sharp line of demarcation, and is covered with a simple layer of pus. Syphilitic ulcerations usually cicatrize after a period of a few weeks, while the lesions of rhinoscleroma may remain stationary for a long period. The lymphatic glands are not as a rule enlarged in rhinoscleroma.

Finally, the diagnosis may be surely established by a microsopical examination of a bit of excised tissue, the characteristic histological appearances together with the demonstration of the bacillus offering conclusive proof of the character of the lesion.

Prognosis.

The prognosis of rhinoscleroma is unfavorable; for while the affection may remain stationary for a long period, its tendency is to spread, and it may endanger life by its obstruction to respiration.

Treatment.

But little can be said on the subject of treatment. Excision offers no hope, as in all the cases where that has been tried the affection promptly recurred. Injections of solutions of salicylic acid and salicylic acid applications in other forms were said to produce good results in a case of Lang's.

MULTIPLE BENIGN CYSTIC EPITHELIOMA.

This affection has been described by a number of different observers under various names suited to the individual interpretation of the pathology. It has been called "Hydradénomes éruptifs" by Jacquet and Darier; "Syringocystadénomes" by Török; "Cystadénomes epithélieux bénins" by Besnier; "Cellulome epithélial eruptif kystique" by Quinquaud; "Gutartiges Epithelioma, verbunden mit kolloider Degeneration" by Philippson, and "Epithelioma adenoides cysticum" by Brooke.

It is characterized by the presence of small, pearly, or slightly pinkish nodules, varying in size from very minute lesions to those as large as a pea or even larger, which are firmly embedded in the skin. They are of a rounded or oval shape, project somewhat above the surface, and although usually scattered about without order, they are in some instances grouped or arranged in rows. The growths are quite firm to the touch and do not cause pain on pressure. In some cases a fine telangiectasis upon the surface of the lesions has been observed, and in some they appear translucent and give the appearance of vesicles. A central depression has also been noted, which was so marked in some of the larger lesions of White's case as to suggest the crateriform epithelioma of Hutchinson.

The face, neck, and upper extremities are the usual seats of the tumors. They have also been seen upon the scalp, chest, and trunk.

In most of the cases reported the tumors have first been noticed as early as the age of puberty. They usually increase very slowly in size and numbers, and, although never undergoing spontaneous involution, no tendency to break down or to ulcerate had been noted until the publication of White's case. This case, which occurred in a woman of forty-five, a native of Germany, was remarkable on account of the great diversity of the lesions and the evident malignant change that was occurring in some of them. Together with the small, firm nodules from the size of a pin's head to that of a pea, such as have been observed in the other cases, much larger lesions, some of the size of a quarter-dollar, were present, which presented in other respects all the usual features. There were also several large lesions with abrupt perpendicular edges and depressed centres, and the right upper eyelid was occupied by an irregular elongated ulcer, so that the lid could be only partially raised. Both lids of the left eye and the side of the nose were the seats of ulceration, which had destroyed all the cutaneous tissues. These ulcerations presented the appearance of the usual rodent ulcer.

Fordyce has reported a case where a mother and daughter were affected with precisely the same lesions and where a similar eruption was said to exist in other members of the same family. Brooke relates an instance where a mother and two daughters were similarly affected. In the other reported cases no history of heredity is mentioned.

Pathology.

As is seen by the names that have been given to the affection by different authors, there has been much diversity of opinion as to the pathology of this affection. Jacquet and Darier first considered the growth to be an adenoma of the sweat glands with cystic degeneration, as the histological appearances in many places suggest very strongly an implication of these structures. Later, however, they changed their opinion and considered the growth to be produced by misplaced embryonic epithelial cells, which for a time remained latent, and were finally in some way excited to proliferation. Philippson also accepts this view, and believes further that this disease is identical with that described as colloid milium, or colloid degeneration of the skin, a view that is not supported by sufficient evidence. The disease that has been described by Kaposi as lymphangioma tuberosum multiplex is now regarded by most authorities as identical with multiple cystic epithelioma, and with good reason.

The microscopical studies of Fordyce and Brooke have thrown

additional light upon this process. They found (and the writer's investigations accord fully with theirs) that the tumors were composed of rounded and elongated masses and islands of epithelial cells, which were connected and intermingled with one another in the most complicated manner. In the midst of these epithelial bands and islands small cysts are frequently seen, containing a homogeneous or granular substance and some large deeply stained cells. In places the outline of epithelial cells which have lost their capacity for receiving the stain and which are evidently being converted into the colloid substance can be traced. There are also "cell nests" present, such as are seen in the malignant forms of epithelioma, which have undergone a horny or colloid change. A connection between these epithelial masses and tracts and the lower cells of the rete may be observed in some part of all the lesions. The epidermis is normal and there is no implication of the glandular structures.

This affection is now, therefore, proved to be an epithelioma of the skin, accompanied by colloid degeneration and the formation of small cysts. In all the cases except that of White the lesions were benign in character, but the marked malignant character of many of the tumors in that case necessitates some reserve in adding the adjective benign to the descriptive name. It is of course a question, as pointed out by White, whether the tumors in this case had undergone a secondary chance malignant transformation, as is occasionally seen in verruca, keratosis, and tuberculosis for example; or whether the tendency of all such new growths after the lapse of time is towards such a termination. The fact that many of the recorded cases have been observed in young subjects would lend some probability to the latter view, but the question can only be decided by further observations. As to the origin of the tumors, the fact that the epithelial masses have been found to be in places continuous with the lower rows of rete cells, does not, as Brooke has said, preclude the possibility of their embryonic origin.

Treatment.

Neither external applications nor internal medication have thus far proved successful in removing the tumors. They may be treated surgically by means of the knife or curette. Many of the smaller ones are well suited for the employment of electrolysis, as has been described in connection with xanthoma and other small growths. In view of the possibility of a malignant termination, destruction should be recommended in cases where it is applicable.

ADENOMA SEBACEUM.

This affection, which consists of small tumors caused by hyperplasia of the sebaceous glands, was described long ago by Addison and Gull, and by Rayer, although Balzer was the first to interpret rightly its anatomical character. Since then cases have been observed in France by Vidal and Hallopeau, in England by Mackenzie, Pringle, and Crocker; in Germany by Caspary, and in America by Pollitzer. Crocker considers it very probable that the disease is much more common than is supposed, as many of the patients have epilepsy and do not therefore come before the observation of the dermatologist.

The situation of the disease is as a rule the face, and the tumors are most abundant at either side of the nose, in the place where acne rosacea is most common. They may, however, be scattered all over the face; on the forehead they are not numerous, although sometimes quite large lesions are found here. They are usually symmetrical in their distribution, exceptions to this rule being found in the cases of Jamieson and Crocker. In Pollitzer's case they were in the form of a linear patch on the side of the forehead.

They are small, round, convex tumors, varying from a pin's point to a split pea in size, of a reddish or brown tint, or they may be of the color of the normal skin, or of a waxy hue. In many but not all of the cases, small dilated capillaries are seen ramifying over the surface, and the color is greatly dependent on the presence or absence of these telangiectases. In Vidal's case the dilated vessels were very marked. On pressure they do not lose their color, nor are there any subjective sensations.

The tumors are apparently of congenital origin, as in some of the cases they were either present at first or appeared shortly afterwards. As a rule they make their appearance gradually, often taking on a greater activity in size and in numbers at the age of puberty. Some of them may undergo spontaneous involution, leaving in their place small scars. The epidermis over the tumors may be smooth, or rough and warty, and fibromata, true warts, nævi, and pigment spots are often seen scattered over the face and body of the subject affected. A coarse skin, with numerous comedones, is a common association.

Etiology.

In many of the cases a defective mental development has existed, and epileptics and imbeciles are frequently found among its subjects. Crocker thinks that it is probably not uncommon in asylums. It is

said to occur most frequently among the poor. The disease is not confined, however, to the lower classes or to those of inferior intelligence, as instances have been described of its occurrence in people above the intellectual average. The fact that it has in many of the recorded cases occurred in people of defective mental development is interesting in view of the fact that fibromata are often associated with it, which occur, as is well known, very frequently in this class of subjects. It is conceded that the tumors are of congenital origin.

Diagnosis.

The disease is to be differentiated from colloid milium, multiple benign cystic epithelioma, and perhaps acne rosacea.

Colloid milium or colloid degeneration of the skin, as described by Besnier, has its seat more especially in the upper two-thirds of the face, and the lower portion is seldom affected. The lesions are more yellow in color than those of adenoma sebaceum and do not exhibit telangiectases upon their surface. They are usually less numerous than the lesions of adenoma sebaceum. Balzer's investigations have shown that there is a colloid degeneration of the cells and fibres of the upper portion of the corium, particularly in the vicinity of the sebaceous glands, but that there is no affection of the glands or other epithelial structures which distinguishes it positively from adenoma sebaceum.

Multiple benign cystic epithelioma may easily be confounded with adenoma sebaceum and it is doubtful whether in any case, during the present incomplete state of our knowledge of the clinical characters of these affections, a positive diagnosis could be made without a microscopical examination. Benign epithelioma has been said to affect the forehead and trunk more frequently.

Acne rosacea should not be difficult to exclude, as it usually begins earlier, has a marked tendency to suppurate, and is formed chiefly at the site of occluded sebaceous glands. There should be no hesitation in differentiating between the nodules of lupus vulgaris and those of adenoma sebaceum.

Pathology.

Anatomically there has been found to be hyperplasia of the sebaceous glands, which in some instances make up almost the whole microscopic field. Pollitzer found that there was no hypertrophy of the glands, as the individual cells were no larger than they are normally. Balzer found in one of his cases small cysts in both the sebaceous and sweat glands. Pringle has described an interpapillary hyper-

trophy, which was not present in a case reported by Crocker, who noted an unusually large number of sweat glands and of rudimentary hair follicles, so that there was an increased development of all the appendages of the skin. In one of the lesions examined there was a marked hyperplasia of the fibrous tissue. He regards the disease as a congenital hyperplasia of the glands, which develop from embryonic remnants, and, as in his experience it affects all the appendages, he would classify it as a pilo-sebaceous hydradenoma. Further cases and careful histological studies are necessary before the foregoing points can be definitely settled. The difficulty that often times presents itself of distinguishing microscopically between an hypertrophy and a hyperplasia of glandular elements, should caution investigators against deciding hastily, in a given case, in favor of an adenomatous hyperplasia.

Prognosis.

Spontaneous involution may occur, but it is very rare. Usually the lesions increase in number up to a certain point, where they remain stationary. They rarely increase in size.

Treatment.

This is entirely surgical, as internal medication and external applications have no effect. The knife, the curette, and scarification have all been employed. Crocker has removed the lesions successfully by means of electrolysis, using the needle attached to the negative pole of the galvanic battery with a current of three or four milliampères.

XERODERMA PIGMENTOSUM.

BY

MORIZ KAPOSI,

VIENNA.

XERODERMA PIGMENTOSUM.

History.

In 1870, in Hebra and Kaposi's "Lehrbuch der Hautkrankheiten," Part II., page 182, I described under the name of xeroderma a cutaneous affection of a special character. My description was based upon two cases observed by me of a disease which is invariably congenital, that is to say, its presence dates from earliest infancy, and which I divided into two forms.

While the disease which I distinguished as the second form of xeroderma might find its analogue, according to my conception, in certain morbid pictures observed by Erasmus Wilson, who had likewise applied to them the name of xeroderma, the above-mentioned affection, which I then distinguished as the first form of xeroderma, could be characterized as an absolute novelty in pathology.

In 1882 I described the same disease in the *Wiener medizinische Jahrbücher* with the report of six new cases, or a total of eight, accompanied by five plates (four chromolithographs of the morbid features and one histological plate) under the title of xeroderma pigmentosum. I did so, in the first place, in order to offer for mutual understanding a brief name for the disease, and, in the second place, to express even in its title the most essential characteristics.

According to the definition which I gave in 1870, the word "xeroderma" was to designate atrophy of the cutis proper, and the adjective "pigmentosum" the second essential factor that the atrophy starts from a skin antecedently covered with abnormal pigment spots.

All the cases observed thus far had occurred in children and youths up to the age of eighteen years. Five were girls, one was a boy aged two and a half, and two were youths aged respectively sixteen and eighteen years. The third and fourth cases and the fifth and sixth cases respectively affected children of the same parents.

The delineation of the new morbid entity in 1870 was based upon two cases from which I was able to deduce all the essential and characteristic symptoms, the development, the appearance, the course, and the final termination of this process. In fact it may be said that up to the present day no other author has added anything particularly

new or supplementary, and certainly nothing that would call for a change or modification of my original description of the disease. For this reason the expectation that other observers would thenceforth be able to recognize the disease was soon realized.

Indeed, in the succeeding years several observers reported similar cases which agreed in all points with those described by me: onset of the disease in the first to the second year of life; the appearance of pigment spots, resembling freckles, upon the face, the hands, and the adjoining regions of the skin; presently the occurrence of punctiform and larger atrophic spots resulting in areas of glossy white thinning of the skin resembling cicatrices and surrounded by telangiectases; a very early development of warts and multiple carcinomata and sarcomata; a frequently fatal termination; and several times the occurrence of the disease in children of the same parents.

Aside from Geber, who while assistant at our clinic described my third and fourth cases, occurring in two sisters, under the title, "Ueber eine seltene Form von Nævus der Autoren," instances of the disease have been reported, since my first communication, by Glax,[1] Taylor, Heitzmann, Duhring, W. Rüder, and others. And although perhaps Glax's case impresses one rather as an instance of scleroderma in the atrophic stage than as true xeroderma pigmentosum, there is not the least doubt that the reports of the other authors named described cases identical in every particular with the disease under discussion. Thus Taylor,[2] in 1877, at the first meeting of the American Dermatological Association, was able to present seven cases, two of which were sisters; then C. Heitzmann published a case in a man aged forty, and Duhring[3] in 1878 another case. W. Rüder,[4] who some years before had observed the occurrence of epithelial carcinoma of the skin in several children of one family, then recognized the disease as the one called by me xeroderma pigmentosum and in 1880 published the histories of the cases which occurred in seven brothers.

But it was not until 1882, when I added illustrations to my paper, that the diagnosis of this well-marked disease seems to have become generally easy. From that time forward numerous reports of cases of xeroderma pigmentosum appeared, together with the resuls of the clinical and histological examinations of the lesion, so that in 1885 when I published a tabular collation[5] I was able to present thirty-eight cases with corresponding details. In addition to the twenty-four cases mentioned above, the paper contains my own ninth case, two of Neisser, five of Vidal, three of Radcliffe Crocker, and three of F. J. Pick—total thirty-eight cases.

In a table compiled in 1890 by Archambault[6] fifty-seven cases

are enumerated, the additional reports being taken from Crocker, Dubois-Havenith, J. C. White, Brigidi and Marcacci, Funk, Riehl, Brown-Hunter, Arnozan, Piéchaud, Elsenberg, Archambault, Quinquaud, Thibièrge, Pringle, and Schwimmer. To these may be added cases of Janowsky, Bernier, and Brayton. Finally the most recent article on the subject by Lukasiewicz' completes the list by citing the later cases of Köbner-Block, Stern, Rino, Arnozan, Brayton, Murphy, McCall Anderson (1881), M. B. Hutchinson, Zeferino Falião, Stein, and Schütte. The total number of cases of xeroderma pigmentosum published up to 1895 amounts to seventy-three reported by thirty authors. If we add to these three cases from our clinic found in the annual reports from 1886 to 1890—(two cases were published before) among which were three with carcinomata and one terminating fatally—we obtain a total of seventy-six cases hitherto published.

This number of cases of xeroderma pigmentosum is so large that a further extension of the list would hardly appear necessary, the less so because they confirm the characteristic symptoms of the disease, the uniform onset in earliest childhood, the frequent occurrence in children of the same family, proving the hereditary and congenital disposition, and the likewise frequent transformation into multiple carcinomata and sarcomata with fatal termination.

Development, Symptoms, and Course.

The disease always begins in earliest childhood. So far as direct observations regarding the first months of life are available, or as may be gathered from reliable histories, the affected children presented a perfectly normal skin during that period. In very rare instances only does the history show, or has it been observed by an author (Lukasiewicz's most recent case), that the children suffered repeatedly under the influence of the sun or wind with an acute erythematoeczematous inflammation of the skin of the face, neck, and hands. Such attacks, however, always ran an acute course and ended in desquamation and temporary diffuse brown pigmentation of the skin; they were noted partly before the cutaneous alterations peculiar to xeroderma pigmentosum were manifest, partly after the existence of the disease had been determined. But in the great majority of the cases nothing of the kind has been observed or reported.

The observation of cases coming early under treatment and the statements of intelligent relatives show that the disease begins without any such inflammatory eczematous and erythematous prodromes. In the course of the second year of life there appear numerous pale

reddish-brown to dark-brown points and spots, ranging in size from that of a pin's head to that of a lentil, upon the skin of the cheeks, nose, forehead, lips, neck, dorsal aspects of the hands and arms, also upon the palms, on the back, and the region of the shoulders.

At this time both the spots and the intervening normally pigmented skin look and feel smooth and pliable. Very soon, however, towards the end of the second and in the course of the third year,

FIG. 56.—Xeroderma Pigmentosum.

evident nutritive and structural alterations set in in the epidermis and the cutis within and between the pigment spots, which latter at the same time become more numerous, more closely aggregated, and extend to regions at first left intact upon the face, the neck, the upper part of the trunk, and the arms.

The nutritive alterations mentioned above manifest themselves as punctiform and streak-like angiectases upon and around the freckle-like lesions, and as depressions corresponding either to the latter or to the interspaces, which are the size of a lentil or larger, white,

glossy, and scar-like, the epidermis of which is wrinkled or in a state of branny desquamation; in other words, the signs presented are those of a spontaneous cicatricial atrophy which, at a later period, has a punctiform, streaky, or more diffuse arrangement. By the middle or end of the third year of life the disease process may be very pronounced.

The face, auricles, neck and nucha, shoulders and chest to the level of the third rib, arms and dorsa of the hands, sometimes also the palms, legs, and dorsa of the feet, appear sprinkled with smaller and larger freckle-like yellow to sepia-brown spots (ephelides), between which are pockmark-like, glistening white, shallow pits, or else the intervening skin is normal in color and quality. Numerous scattered punctiform and larger, also linear and sinuous telangiec-

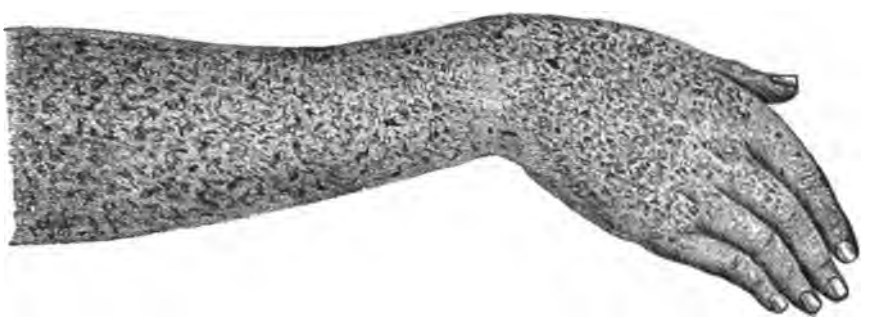

FIG. 57.—Xeroderma Pigmentosum. From the same patient as Fig. 56, showing the pigment-spots on the forearm and the hand.

tases, passing between the brown spots and cicatricial depressions, increase by their red color the piebald appearance of the skin thus affected. The epidermis looks thin, here and there smooth, at other points desquamating in fine lamellæ, or slightly wrinkled, furrowed, or fissured, and dried up like parchment. The cutis feels thinned and when the disease is of long standing it is folded with difficulty, adheres more firmly to the underlying structures, seems as if it were shrunken together, and is poor in fat.

The integument of the rest of the body is full, pliable, sufficiently lubricated, normally cushioned with fat, and healthy in every respect.

The process shows a tendency towards a continuous development, new pigment spots and telangiectases appearing, while in the other parts glistening white cicatricial marks and pits are in process of formation. Ulceration does not occur in this stage.

In the succeeding years, however, with the advancing shrinkage of the skin there appear complicating eczema, shallow phagedenæ,

and superficial losses of substance over the extensor surface of the finger joints (which become fixed in semi-flexion), thinning and retraction of the alæ nasi, narrowing of the orifices of the mouth and nose, and ectropion of the lower eyelids with consequent xerosis of the cornea.

In a considerable number of cases other changes occur, sometimes as early as the fourth and fifth to the tenth year of life, sometimes not until the eighteenth or twentieth year, at times as late as the fortieth or fiftieth year. These changes consist in excrescences which may be single or multiple to the number of forty and more; they are pigmented and vascularized, verrucose, superficially fissured, weeping, and inclined to bleed. Their size ranges from that of a pin's head to that of a pea, and within a few months they may, singly or together, present all the characteristics of shallow, firm, sharply demarcated epithelial cancers or be transformed into mushroom-like, roundish, melanotic, fungous carcinoma or sarcoma nodules with constricted base, or into ulcers of an extremely destructive tendency, so that within a few months up to one or two years the entire cutaneous and cartilaginous portions of the nose, half of an auricle, an eyelid, and a part of the lip may be destroyed.

Once only have I observed, after such a destruction of the nose and effective elimination of the neoplasm at this point, a recurrence in the form of nodular and infiltrated carcinomata on the left elbow and later on the dorsum of the hand on the same side, in an old woman (case N—— of my list). Otherwise the excrescences recur, or rather, to speak more correctly, new malignant formations continue to develop about the face, and after a longer or shorter time terminate fatally either by a sloughing glandular carcinoma of the cervico-maxillary region caused by them, or else by carcinomatous metastasis in the internal organs or by the cancerous cachexia.

Pathology.

As regards the nature and the importance of this peculiar process different opinions have been expressed in proportion to the increase in the number of cases reported and the multiplicity of observers. These differences are due to the clinical peculiarities of the particular case under observation or to the histological findings; while the latter again varied according to the stage of the cutaneous change when examined and its theoretical interpretation. Most authors have attached the greatest importance to the above-described vascular new formation and ectasia or to the pigmentosis, and their views have found expressions in the new names proposed for the disease. Thus,

as stated before, Geber called it a peculiar variety of nævus pigmentosus; Taylor, angioma pigmentosum et atrophicum; Pick, melanosis lenticularis progressiva. Others again, in view of the appearance of atrophy, have selected a corresponding term; thus Neisser, amplifying the name liodermia essentialis chosen by Auspitz, called it liodermia cum melanosi et telangiectasia; Crocker, atrophoderma pigmentosum; and finally Vidal, leaving the decision to a future time, proposed a kind of literary-historical name for the disease, namely, dermatose de Kaposi.

To-day when again so many new investigations of the subject have been made, there is, in my opinion, still no reason for rejecting the name originally chosen by me—xeroderma pigmentosum. In the first place it is historically justified, and in the second place it is shorter in expressing what the long and complicated terms since proposed endeavor to convey or partly fail to note—namely, that we are confronted with a process of cutaneous atrophy (xeroderma of Kaposi), associated with pigment formation and vascular disease or springing from them.

Being a dermatosis beginning in earliest childhood and manifesting itself by pigment spots and telangiectases, xeroderma pigmentosum reminds us particularly of melanosis adnata, of nævus and lentigo. But it differs materially from nævi, which as a rule remain stationary or at most undergo progressive and degenerative alterations in later life and usually only in old age, by the continuous atrophic change of the affected cutis which begins in earliest childhood and proceeds *pari passu* with the steady and rapid advance of the disease.

This conception, which I published as early as 1870, finds its justification in the pathologico-anatomical relations which were likewise stated by me at that time, and which not only clearly elucidate the actual morbid process of xeroderma pigmentosm, but also explain the complication with multiple carcinomatosis.

Pathological Anatomy.

Although many histological examinations have been made of the skin affected by this process, and although the details furnished by some of the investigators—*e.g.*, the most recent ones by Lukasiewicz—are valuable, they agree in the main with those originally published by me in 1870.

According to these we find first, corresponding to the pigment spots, the histological picture of lentigo and nævus pigmentosus—namely, abundant deposits of pigment in the basal and inferior layers of the rete Malpighii, and at similar points in the papillæ and the cutis,

where the pigment is enclosed partly in fusiform, multipolar, and roundish so-called migratory cells—chromatophores. Pigment appears also in the cellular sheaths enveloping some of the blood-vessels, in fissures corresponding to lymph spaces or their endothelia

FIG. 58.—Region of a Pigment Spot. Pigment is present deep in the rete, in the corium, and in the root sheath of the hair.

(Lukasiewicz), and finally in the cells of the external proliferating root sheaths of the hair follicles.

The histological picture, therefore, is that normally present in a skin which is originally pigmented in spots, while the portions of

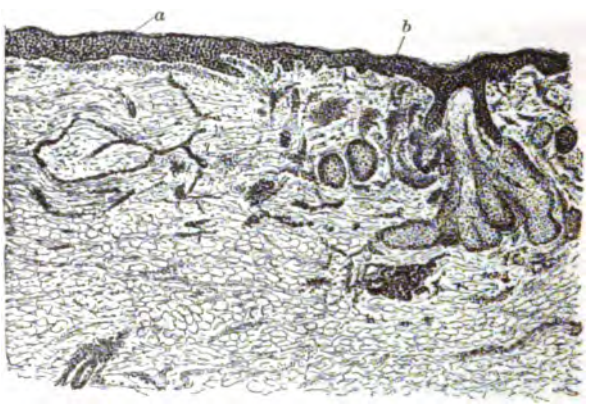

FIG. 59.—Section of a Citratricial Atrophic Region. At *a* the papillæ have disappeared together with the pigment and the cones of the rete, and the vessels are undergoing obliteration; at *b* the papillæ, rete, sebaceous glands, hair follicles, coil glands, and pigment are still present; the rete is proliferating.

the skin lying between the lentigines show a perfectly normal histological composition. The latter appearance, however, changes soon with the occurrence of the true characteristic clinical features of xeroderma pigmentosum, *i.e.*, the atrophic points and spots.

Corresponding to the latter we find a flattening and complete obliteration of the papillæ and disappearance of the rete. As in true cicatrices there is above the rete no basal layer having a palisade-like arrangement, and there are no regularly formed prickle cell and granu-

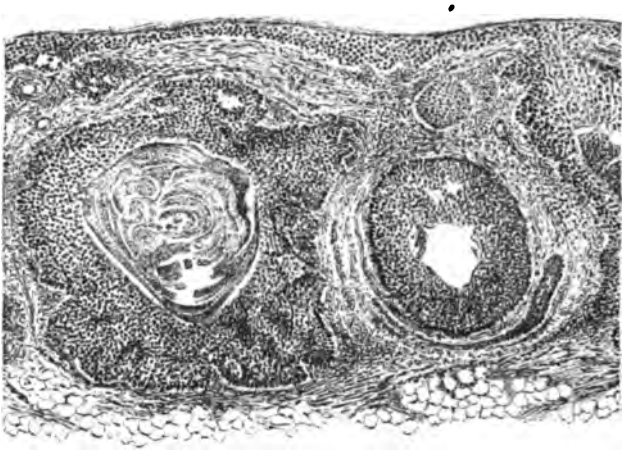

Fig. 60.—Cystoid Dilatation of a Sebaceous Gland.

lar cell layers; we see only a few rows of flat polygonal, dry, and absolutely non-pigmented cells immediately contiguous to the corneous cells. Underneath in the corium the migratory cells which carry pigment are absent. An occasional ectatic vessel, and others atrophied into firm cords pass through the corium, which has become thin and

Fig. 61.—Sebaceous Gland in a State of Cystoid Dilatation (*b*) with Degenerated Contents, the parietal epithelium exhibiting conical outgrowths (*a*).

dry. The fat-cell layer has also undergone some degree of atrophy. Many of the hair follicles and sebaceous glands have become obliterated; some of the latter are dilated into cysts filled with sparse cells and a crumbly granular mass.

Side by side with these findings we observe in the neighborhood of the atrophic patches alterations of an opposite character in the way of proliferation and hyperplasia. The latter appears as hyperchromatosis of the epidermis and the corium, so that around the white atrophic patches the pigment spots are much darker, shading into a brownish-black, than the freckles

Fig. 62.—Proliferation of the Epithelium of the Rete and of the Root Sheaths of the Hairs.

Fig. 63.—The Same as the Preceding under a Higher Power.

in regions which have not yet become atrophic. The hypertrophy, however, affects also to a considerable degree the cell layers of the rete and of the external root sheath of the hair follicles; here and there, too, even the parietal epithelium of the sebaceous glands. These conditions cannot be demonstrated clinically, but are merely histological. The cones of the rete extend as wide cords into the corium; they may be simple, club-shaped, or branching, encroaching upon and uniting with neighboring ones. At corresponding points the papillæ may remain at the normal level or may rise far above it, thus forming warts with a proliferated smooth, or subsequently fissured, covering of rete cells and corneous cells. At the same time the walls of the blood-vessels appear proliferated and are accompanied by accumulations of leucocytes; here and there they are dilated and the connective-tissue layer is succulent. All these manifestations are evidences of a slow inflammatory nutritive process.

The hair root sheaths also exhibit conical and club-shaped proliferations, here and there associated with dilatation of the hair follicles. A similar change affects the parietal epithelia of the sebaceous glands, often accompanied by dilatation of the acini of the glands and disintegration of their central contents.

According to these findings, which have been confirmed in the main by most investigators, the process seems to begin with the proliferation of the connective tissue of the papillæ and vessels; the latter then

FIG. 64.—Cancroid Bodies, *c*, *c*, in the epithelial layer and corium; *f*, gland tube in a state of cancroid proliferation and degeneration.

contract and become partially obliterated, in consequence of which their branches become ectatic and tortuous, further new formation of vessels ensues, and as a direct result of this occur irregular accumulations of pigment with proliferation into the depth of the cones of the

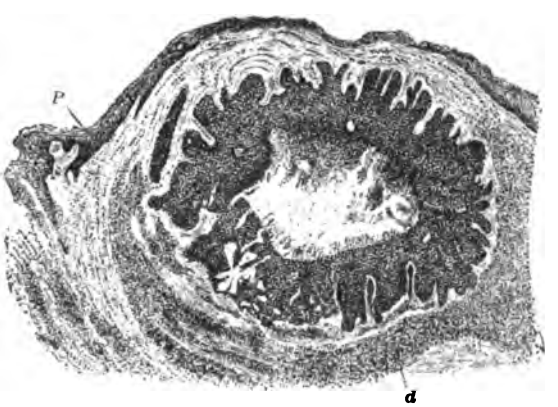

FIG. 65.—Section of a Cancroidal Nodule. *P*, Atrophic skin. Central softening of the former and peripherally a conical outgrowth into the corium, which is infiltrated with round cells.

rete, ectasia of the glands, and partly proliferation, partly degeneration of their epithelium.

Obviously it is this disproportionate growth of the epithelioid

structures, as distinguished from the connective-tissue stroma, which gives rise to the development of carcinoma and sarcoma—which is certainly remarkable at such an early age.

Essentially the same condition is met with in the senile skin during the development of carcinoma or sarcoma from preëxisting papillary warts or pigment nævi. The only difference is that in the latter case it is the senile change in the vessels and the senile degeneration of the connective tissue of the cutis which set up the proliferation of the epithelioid structures, *i.e.*, tissue of a lower order, as opposed

FIG. 66.—A Portion of Fig. 10 (*d*) under a Higher Power. *a*, Proliferating cancroidal cells; *b*, round-cell infiltration of the corium.

to the vegetation and regeneration of the connective-tissue stroma, *i.e.*, tissue of a higher order.

But the fact that this process begins in the earliest age and progresses steadily, while agreeing completely in its minute features with the analogous senile process, constitutes the essential and peculiar characteristic of xeroderma pigmentosum.

The histological conditions of the carcinomata and sarcomata, as such, that present themselves in xeroderma pigmentosum do not differ from those of the same growths occurring in adult life or old age. Only in their course they show a peculiar feature, since, corresponding to the rapidly and steadily progressing fundamental process, they likewise develop with remarkable celerity and in great numbers within a period of weeks and months, and accordingly their local destructive effect is also extremely rapid and leads to deleterious metastases.

Etiology.

Of the cause of xeroderma pigmentosum we know nothing. It certainly must be based upon a congenital formative and nutritive anomaly of the papillary layer, its vascular and pigment portions, since it always begins in the first year of life. The congenital tendency manifests itself besides by a second factor, which has been mentioned above and has been frequently observed among the cases hitherto reported—namely, the occurrence of the disease in several children of the same family. Among my cases were respectively two and three members of one family, and among the forty-three cases which I first presented in tabular form two brothers and sisters were affected six times; three children, four times, and once even seven children. The same fact has also been observed in the later cases.

Several authors have given as the occasional cause of xeroderma pigmentosum the influence of light, of the ultra-violet rays of the sun. This cannot be granted for the pigment spots constituting the initial lesion of xeroderma pigmentosum any more than for freckles, lentigines, and other larger pigment nævi in general, which, as is well known, occur as often upon parts of the body never directly exposed to the sun, such as the nates, penis, back, and the palm of the hand, as upon the face and the hands.

It has been urged in support of this view that some authors have reported or observed (Lukasiewicz) that such children after a short stay in the open air were regularly or frequently affected with erythema solare or eczema of the face, followed by desquamation and darkening of the skin. But to this it may be answered that this affection was always merely transitory, and that the sunburn was not a nævus but a temporary diffuse pigmentation; and such phenomena would imply at most that the papillary vascular system of those children is abnormally irritable from the start and unstable in tone, but they prove nothing as to the etiology of xeroderma pigmentosum, especially as they were absent in the great majority of the patients in question.

Diagnosis.

The diagnosis of xeroderma pigmentosum does not seem to be difficult, for after my first verbal description a whole series of cases of the kind was reported; Rüder was even able to recognize retrospectively as xeroderma pigmentosum a number of cases which he had seen previously. This was the case to a much greater degree after I had added some illustrations to my paper in the year 1882.

In fact, a person who has ever seen such a case cannot be blind to its peculiarities and will diagnosticate the disease at once.

There is, to be sure, a certain similarity to the atrophic stage of *scleroderma*. The most material difference rests on the fact that in scleroderma there is always a condition present in which the skin is tense, contracted, and of an alabaster-like whiteness, and at the same time feels as hard as a board, and stiff, as if frozen, or like marble, while the epidermis is smooth. From this condition the skin may return to a perfectly normal state or afterwards suffer atrophy and shortening when the epidermis at the same time becomes wrinkled and there may also be present pigment spots and vascular ramifications. But the stage of sclerosis is always the primary and essential feature, the atrophy merely a terminal stage which may often be altogether absent. Other material differences are that the condition is not congenital but usually occurs in later life, and finally that it is not so typically located.

Xeroderma pigmentosum, in my opinion, bears an even greater resemblance to *pigment lepra* described by me than to scleroderma atrophicum, so that a mistake in this direction is more probable. Aside from other factors (origin in a region where leprosy is prevalent, localization of the lesions), attention should be paid to the fact that in lepra maculosa diffuse pigmentations exist by the side of the small patches, which is not the case in xeroderma pigmentosum, not to speak of the anæsthesia and the mutilations occurring in leprosy.

Finally there are cases in which *ephelides* are present in large numbers about the face, shoulders, and arms from earliest childhood; but they remain stationary for life and therefore cannot be diagnosticated as xeroderma pigmentosum. It is the commencing atrophy which would characterize a case as such.

Prognosis.

The prognosis of xeroderma pigmentosum is unfavorable, especially in view of the tendency to the development of epithelioma and sarcoma. I cannot understand how some authors can speak of it as favorable. Nobody has ever cured it, and moreover, it is impossible to prevent the development of the multiple carcinomatosis. It is true, life is not in jeopardy as long as the latter does not occur; but the permanent and progressive disfigurement is a sufficiently grave evil. Moreover, even when general carcinomatosis fails to appear, the occasional cancerous destruction of the nose and eyelids or the occurrence of xerophthalmus cannot be interpreted as favorable characteristics of a disease.

Treatment.

The treatment is restricted to the alleviation of the subjective symptoms—the tension, the dryness, the painfulness of the rhagades, excoriations, and ulcers—and the removal of the malignant complications—carcinoma, sarcoma, warts, and angiomata—whenever they develop. Unquestionably much can be done for the patient by assiduity, skill, and perseverance, and thus perhaps the fatal termination may be retarded or prevented.

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DERMATONEUROSES.

BY

H. LELOIR,

LILLE.

DERMATONEUROSES.

THE study of the neuroses of the skin has actively and closely engaged my attention since 1878, during which time I have published several articles upon this important part of cutaneous pathology. It was my intention to publish in book form the result of my researches, when the invitation of the editor of the present work decided me to give him my first connected presentation of this subject. I have endeavored to set forth as completely as possible the state of our present knowledge concerning the neuroses of the skin, but now that the work is finished I realize its incompleteness. The group of dermatoneuroses is in fact so large, so complex, the limits of the subject are so constantly being extended, that we can as yet do no more than trace its outlines, not pretending to go completely into the details of the subject. Time and the coöperation of many investigators are necessary in order that this subject may be finally presented in a complete and satisfactory manner.

As I wrote in 1881, the neuroses of the skin constitute one of the most important divisions of cutaneous pathology, a division scarcely touched upon, strange to say, in the classical treatises, even those of most recent date.

When I published the results of my early investigations concerning the affections of the skin of nervous origin,[1] I did not believe, in the face of the many objections which were raised on all sides by eminent dermatologists, that the importance of the rôle played by the nervous system in a large number of skin diseases would so soon and so universally be admitted by medical authorities. The works of Pitres and Vaillard; the article, "Vaso-moteurs" by Mathias Duval in the "Dictionnaire de Jaccoud"; the article "Peau" by Hahn in the "Dictionnaire Encyclopédique des Sciences Médicales"; the article "Dermalgie" by Arnozan in the same dictionary; the memoir of Schwimmer in Austria; in England, the works of Radcliffe Crocker and of Malcolm Morris; in Germany, the works of Mayer, of Kopp, and of Unna; in Russia the researches of Pospelow and Polotebnoff; in the United States, the works of L. Duncan Bulkley, of Duhring,

Robinson, Ohmann-Dumesnil, and Prince A. Morrow; in Brazil those of Aranya and of Moncorvo, serve to demonstrate the correctness of these early deductions.

Later contributions to this subject were made by me in the *Annales de Dermatologie*[1] and in the *Bulletin de l'Académie de Médecine*,[2] and by my pupils O. Lebrun,[4] Masurel,[5] Levèque,[6] Dupas,[7] and Baude[8] in Thèses de Lille of different years.

It may be permitted me to recall the importance which I attributed in 1886 to pruritus and to the other nervous phenomena in the production of various dermatoses: "Pruritus and the nervous phenomena precede the eruption, and I should say at this time that they are often the cause of it."

Some years after Brocq and Jacquet confirmed my opinion in a manner perhaps too unconditional in some respects, by saying that pruritus is productive of eruptions. They ought to have included the other nervous phenomena in this assertion.

This manner of regarding the origin of certain neuroses of the skin served as the basis for a series of articles published by Besnier, Brocq, and Jacquet upon the "neurodermites" (*dermatoneuroses*), which enlarge still further and elucidate the vast group of the dermatoneuroses.

This subject of cutaneous diseases of nervous origin, which had been so neglected up to 1879, despite the articles of Brown-Séquard, Charcot, Vulpian, Bärensprung, Weir Mitchell, Morehouse, and Keen upon the trophoneuroses, has been growing in importance for some years past, and at last is beginning to receive from dermatologists the attention which it deserves.

The teachings in relation to general anatomy, embryology, the development of the individual and of the species, as set forth in the works of Unna, Ranvier, Coyne, Renaut, Fischer, Darwin, Kowalesky, and others, should lead dermatologists to admit the existence of intimate relations between diseases of the skin and those of the nervous system, for they demonstrate that the nervous system is only a differentiated ectoderm, and that the skin may be considered schematically as a sort of peripheral and terminal expansion of the nervous system.

For a long time the relationship between the nervous system and the nutrition of the skin, and the influence of the nervous system in the production of certain cutaneous affections, have been pointed out by various authors. This influence was recognized by the older dermatologists, and we can read with profit in this respect the works of Alibert, Cazenave, Rayer, and others. Although the works of these dermatologists and of some other writers such as Notta, Parrot, Ax-

enfeld, and Paget, called attention to the action of the nervous system in the production of certain dermatoses, we can yet affirm that our knowledge of this subject is of quite recent date. It began to be placed upon a solid basis only when a scientific demonstration was made of the part which the nervous system plays in the nutrition of the tissues and in that of the skin in particular.

If the lesions of the skin which follow traumatic diseases of the nerve centres or the nerves themselves are well recognized, if certain cutaneous affections, especially of the bullous variety, which are met with in the course of diseases of the central or peripheral nervous system are sometimes undeniably dependent upon lesions of the nervous system, this is far from being the case with many of the so-called generic affections of the skin, *i.e.*, the true dermatoses.

Though there are only a few of these whose nervous origin can be affirmed positively, yet various clinical facts justify us in assuming this relation for a certain number of them. Since the time of Alibert every one has recognized the influence of the emotions in the production of dermatoses, and after Alibert, Cazenave, Lailler, Mayer, and others, have so abundantly demonstrated the action of this cause that one is astonished to see it denied by the school of Hebra. In certain cases the part which the nervous system plays in the production of cutaneous diseases is most striking; we refer to those affections which Cazenave has so well described under the name of "neuroses of the skin." For a long time dermatologists have been struck with the frequency of neuralgia, painful affections of the viscera, migraine, severe neuroses, etc., among those suffering from cutaneous diseases. As Rendu very well says in his beautiful memoir upon the alterations of sensibility in skin diseases: "Nothing is more common than to find either alternating or coincident with the cutaneous disease, migraine or painful visceral neuroses, all symptoms which, according to Bazin, are the manifestations of the herpetic or arthritic diathesis. But this same diathesis, this hidden influence, which produces phenomena so different in appearance becomes much better understood if one considers the nervous system as the intermediary cause of certain arthritic or cutaneous eruptions." This is likewise the opinion of Lancereaux in his "Traité de l'Herpétisme."

As to the proofs drawn from the symmetrical distribution of cutaneous affections, they are of some importance, but of an importance which one must guard against exaggerating as Testut has done in an otherwise valuable thesis. This is also true in regard to the arguments drawn from the appearance of eruptions along the course of certain nerves.

Finally, the sensibility* is sometimes profoundly changed in skin eruptions, as Rendu has well shown. An important fact, and one which shows clearly that the nervous affections are not secondary but primary, is the almost entire absence of impairment of sensibility in the artificial eruptions or those produced by external causes, and its presence in the eruptions dependent upon the diathesis.

These different clinical facts in many cases afford a presumption of the nervous origin of certain dermatoses, but in the majority of cases it is upon the pathological anatomy alone that we are able to establish this pathogenesis. The nervous origin of zona, for example, so long unrecognized by the most eminent dermatologists of former times, seemed evident after the clinical work of Parrot; but it was not demonstrated until the day that Bärensprung, Charcot, and others furnished the anatomico-pathological proof. It is in fact through pathological anatomy that many of the obscure points in the study of the nervous origin of the true dermatoses have been cleared up.

As this method of investigation has produced of late numerous and important results we must devote a few moments to a consideration of it. Even up to very recent times the study was limited entirely to lesions of the central nervous system in cutaneous diseases. Yet, although different affections of the skin depend very probably in certain cases upon primary affections of the peripheral nervous system, it often happens that, for several reasons which it is useless to enumerate here, the examination of the peripheral nerves can alone be made. But the examination of the peripheral nerves alone suffices, as I have proved in my memoirs of 1879 and 1881, to demonstrate the nervous origin of the cutaneous affections. The memoirs of Vulpian, Weir Mitchell, Cornil and Ranvier, Poncet, Chambard, Balzer, and myself, confirmed by the important works of Pitres and Vaillard, of Hoggan, of Déjérine, of Terrier and Quénu have abundantly demonstrated that the lesions of the peripheral nerves are not secondary to the cutaneous affections but primary. I cannot here dwell upon the numerous anatomico-pathological facts which demonstrate the truth of this axiom, but would refer the reader to my article on the subject in the *Annales de Dermatologie*, No. 12, 1882. Besides, clinical facts are completely in accord on this point with patho-

* We may remark in passing that the absence of disorders of sensation in certain cutaneous diseases, certain zonas (Barth), sclerodermata (Besnier), vitiligo, etc., proves nothing against the nervous origin of these affections; for the changes in the peripheral nerves do not affect in these cases all the nerve tubes, but only about one-third (vitiligo). So, as I have remarked, and as Schwimmer has since admitted, it is perfectly possible to have in these cases no disorder of sensation clinically appreciable.

logical anatomy, and Rendu, in his memoir, which is so rich in facts, has demonstrated clinically the integrity of sensibility (that is, of the cutaneous nerves) in the simple inflammations of the skin (dermatitis simplex); the idiopathic affections (angioleucitis, erysipelas); traumatic lesions (blisters); in professional and artificial eczema; in psoriasis; in the syphilides and the scrofulides, even the more severe forms, such as lupus, etc.—in fact, in all those affections in which the authors who preceded me and I myself have never been able to find lesions of the peripheral nerves, whilst they are manifest in certain cutaneous affections of the more superficial variety, such as vitiligo, etc., whose nervous origin has been demonstrated (at least in certain cases). As Rendu very well says: "The disorders of sensation are not dependent upon the depth or the age of the cutaneous disease, but upon its nature," and the articles of the pathological anatomists referred to have demonstrated that the lesions of the peripheral nerves in certain skin diseases are not secondary but primary. This is a fact of which many physicians are ignorant, and even dermatologists who are well versed in the study of pathological anatomy. It is very probable also that a certain number of cutaneous diseases of trophic origin are in relation, not with the gross lesions of the nerves, but with the molecular or other lesions not discoverable with our present means of investigation.

And yet it is only recently that some dermatologists, guided by the preceding considerations, have tried to determine whether certain so-called general diseases of the skin ought not equally to be considered as diseases of nervous origin. The clinical and anatomico-pathological experiments which they undertook on this point were most profitable, and, as we have stated above, one can say that now the study of the dermatoneuroses is a plain duty of all dermatologists.

We would designate by the term *dermatoneuroses* all dermatoses secondary to changes in the central, ganglionic, or peripheral nervous system, including not only the pure neuroses but also the eruptious due to a modified action of the nervous system.

CLASSIFICATION.

We may divide these affections into a certain number of classes:

I. The purely sensory dermatoneuroses.

These are cutaneous diseases of nervous origin which present as their subjective phenomena only disorders of sensation in the skin. This group comprises:

(*a*) The different varieties of exaltation of the sensitiveness of the

skin—hyperæsthesia properly so called, dermatalgia, pruritus, hyperalgia, paræsthesia, etc.

(*b*) The different varieties of abolition of the sensibility of the skin or cutaneous anæsthesia.

(*c*) To these two groups we may add a third, viz., the perversions of sensibility.

II. The purely motor dermatoneuroses.

These are cutaneous diseases of nervous origin characterized by a single phenomenon, viz., the contraction of the muscular fibres of the skin, and particularly the glandular muscular fibres of the sebaceous follicles.

III. The vascular dermatoneuroses, or those affecting only the vasomotor system. These are the cutaneous affections of nervous origin characterized by symptoms resulting from abnormal dilatation or contraction of the blood-vessels, and the disorders of nutrition which follow in consequence.

Although these may coexist sometimes, indeed quite often, with the pure cutaneous trophoneuroses, as we shall see later, yet they are entirely distinct from the true trophic dermatoses. It has been plainly demonstrated that vasomotor disorders secondary to affections of the nervous system are insufficient to produce of themselves true trophic changes, though they may play a certain part as predisposing causes. They comprise some forms of hyperæmia, anæmia, erythema, and œdema of the skin, urticaria, stigmata, hæmatidrosis, and certain forms of cutaneous hemorrhage.

Local syncope of the extremities or local asphyxia often constitutes merely the initial stage of a special disease which may end in necrotic ulcerative changes in the extremities. These will be studied in the section on Raynaud's Disease.

These vascular dermatoneuroses are generally of short duration, transitory, and sometimes even very fleeting. They are usually in relation with some transitory and functional modifications of innervation. They may nevertheless appear as the result of organic nerve lesions—often either in the beginning or in the course of their evolution.

IV. The trophic dermatoneuroses, or cutaneous trophoneuroses. These may be divided from a physiological point of view into two groups—according as they are pure cutaneous neuroses, that is, independent of every vasomotor phenomenon; or, on the other hand, as they are found associated with a mixed trophoneurosis, that is, with a cutaneous disease of nervous origin in which the vasomotor disturbances are united with trophic changes in the production of the alterations in the skin.

Although this division may be proposed from the standpoint of pathological physiology, yet clinically it is of secondary importance, for it is very often impossible to determine whether the affections belong to the pure or to the mixed trophic dermatoneuroses. Nevertheless, this class of the dermatoneuroses is one of the most important of the cutaneous diseases of nervous origin. It comprises a large number of changes in the cutaneous surface, some marked by an eruption, others not so marked. The trophic dermatoneuroses, or the cutaneous trophoneuroses, properly so called, are ordinarily rather persistent diseases of the external integument and its appendages. They are generally associated with quite permanent and well-marked modifications of innervation. Numerous and varied are the lesions and eruptions through which are manifested in the integument changes in the central or peripheral nervous system, that is to say, disturbances in the trophic action of the nerves or nervous centres.

Comparing the skin to a gland spread out—which is quite conformable to anatomical and physiological principles—I have, in my work on the cutaneous affections of nervous origin,[1] traced the similarity of the phenomena which appear on the surface of the skin consecutive to the changes in the nervous system to those which may be observed in a gland following changes in the same system. We thus obtain a sort of classified and comparative scheme of the cutaneous diseases of nervous origin:

(*a*) The gland (skin) contains nerves of sensation. These nerves alone undergo modifications of their function—the purely sensory dermatoneuroses.

(*b*) The gland (skin) contains muscular fibres. The change occurring in the function of the nervous system affects only the contraction of these muscular fibres—the purely motor dermatoneuroses.

(*c*) The gland (skin) contains blood-vessels. The change occurring in the nervous system affects only the circulation in these vessels—the purely vasomotor dermatoneuroses.

(*d*) The gland (skin) contains secretory cellular elements. These are affected by the changes in the trophic influence of the nervous system—the purely trophic dermatoneuroses.

Finally the goups *c* and *d* are combined—the mixed trophic dermatoneuroses.

We must content ourselves here with reproducing, slightly enlarged, the table, presented in my article on the trophoneuroses,[1] of the cutaneous diseases whose nervous origin has been demonstrated in a positive manner by a collection of sufficiently numerous and authentic clinical and anatomico-pathological facts, referring the reader for further details to the works of Brown-Séquard, Charcot,

Vulpian, Weir Mitchell, to the articles published by myself and my pupils upon the cutaneous diseases of nervous origin,[1-7] and also to the memoirs of Petres and Vaillard[8] and of Kopp.[9]

The Pure Trophic Dermatoneuroses or Trophoneuroses.

1. Chronic erythema and more or less superficial dermatitis.....
   - Erythema trophoneuroticum.
   - Glossy skin.
   - Ichthyosis.
   - Acrodynia.
2. Papular diseases.....
   - Certain eczemata.
   - Certain lichens.
3. Vesicular diseases.....
   - Certain eczemata.
   - Certain forms of herpes.
   - Zona.
   - Dysidrosis (?).
4. Diseases characterized by bullæ.
   - Certain localized bullous eruptions.
   - Certain cases of pemphigus.
5. Pustular diseases..... .....Certain ecthymata.
6. Ulcerations.....
   - Certain forms of trophic ulceration as yet but little studied.
   - Perforating ulcer.
7. Gangrene.....
   - Symmetrical gangrene of the extremities.
   - Gangrene of central nervous origin.
   - Gangrene of peripheral nervous origin.
8. Certain œdemata, hard or semi-hard.
   Certain elephantiac conditions.
9. Certain scleromata.
10. Scleroderma.
11. Morphœa.
12. Facial trophoneurosis.
13. Syringomyelia.
14. Morvan's paronychia.
    Quinquaud's paronychia.
    Paronychia of Leloir-Merklen.
15. The leproid trophoneuroses.
16. Systemic nervous leprosy. Mixed leprosy.
17. Certain ichthyotic conditions of the skin.
18. Certain hyperkeratinizations.
19. Pigmentary disorders.....
    - Increase of pigment.
    - Diminution of pigment.
    - Vitiligo.
20. Certain forms of cutaneous atrophy.

The trophic lesions of the appendages of the skin will be studied in the group of glandular dermatoneuroses; but they can be considered as a sub-group of the class of trophic dermatoneuroses.

We have omitted in this enumeration certain diseases which, although recently and a little prematurely classed by Schwimmer[10] among the cutaneous trophoneuroses, are not so clearly dependent upon nervous disorders that we can place them in our group of trophic dermatoneuroses (such are elephantiasis Arabum, myxœdema, etc.). Our knowledge concerning xanthelasma is not yet sufficiently fixed, despite the splendid work of L. Chambard upon the condition of the nerves in this disease.

As to psoriasis, the nervous system seems to play an important

rôle in the production of the eruption (in certain cases at least), as Polotebnoff [11] has said, and as I have shown *à propos* of the influence exercised by mental shock upon the appearance of the eruption of psoriasis;[9] yet its pathogenesis is still too obscure for us to be able to place it in a definite manner among the trophic dermatoneuroses. It must not be forgotten, therefore, that, although certain varieties of psoriasis accompanying arthropathies appear to be determined by the lesions of the nervous system,[12] I have nevertheless found the cutaneous nerves grouped in the psoriasis plaques intact in a larger number of cases.

V. The glandular dermatoneuroses.

We designate under this name the cutaneous diseases of nervous origin, characterized by a disturbance of the glandular secretion, secondary to a functional disorder of the nervous system. They have been considered, at least by myself, as a sub-group of the class of trophic dermatoneuroses.

They can be divided into:

(*a*) Dermatoneuroses of the sudoriparous glands	Hyperidrosis. Anidrosis (?).
(*b*) Dermatoneuroses of the sebaceous glands	These are involved in great obscurity; perhaps certain forms of acne and seborrhœa may be included among them.
(*c*) Dermatoneuroses of the hair follicles.	Certain cases of blanching. Certain varieties of alopecia. Trophoneurotic alopecias (peladoïdes).[8]
(*d*) Dermatoneuroses of the nails[13]	Falling of the nails. Deformities and various changes in the nails.

Thus it is evident that a physiological classification of the dermatoneuroses can be strictly drawn by endeavoring to compare, after the method of Claude Bernard, the pathological with the physiological phenomena, and as I have done, likening the skin to a gland spread out.

An attempt to classify clinically the neuroses of the skin, based upon the actual state of our knowledge of cutaneous neuropathology, would be a little premature, since they present the most varied forms, and are found separated in the different groups of the dermatological classifications. Therefore, perhaps, it is better for the moment to confine ourselves to a simple enumeration, and to point out in passing the various cutaneous diseases or groups of cutaneous disease whose nervous origin has been demonstrated in certain cases. Besides, very often the diseases of the skin of nervous origin are mixed. It is quite rare, if the dermatoneurosis has existed for some time, to find a pure sensitive, motor, or vasomotor neurosis. Often the lesions of a cutaneous trophoneurosis will be superadded.

On the other hand, it is rare for a trophoneurotic disease of the skin to exist as a pure trophic dermatoneurosis. Frequently it is accompanied by secondary glandular, vasomotor, or other disorders. In a word, it is uncommon to find a neurosis of the skin existing absolutely within the limits of the preceding physiological classification. Consequently a physiological classification, such as we have proposed, is of little practical utility, and its application will meet with obstacles on every side.

We will now enter upon the clinical description of the different neuroses of the skin previously indicated, although concerning a certain number of them, which have been already treated in detail in different portions of this work, we will say only a few words.

As to the special treatment applicable to each of these dermatoneuroses, we shall take that up after the chapter on the treatment of the neuroses of the skin in general.

I. SENSORY DERMATONEUROSES.

These are cutaneous affections of nervous origin, which present as primary symptoms only the subjective phenomena of disorders of sensation in the skin, either exaltation, abolition, or perversion.

It is well to make the observation in passing that, although these conditions are very different and perfectly distinct, clinically, yet ordinarily exaltation, abolition, and perversion of sensation appear to be most intimately related to each other.

In this group are found:

(*a*) The different forms of exaltation of cutaneous sensibility—hyperæsthesia (dermatalgia), pruritus, paræsthesia, etc.

(*b*) The different forms of abolition of cutaneous sensibility, or the anæsthesias.

(*c*) To the preceding groups we may add a third, viz., the perversions of cutaneous sensibility.

It must be remarked at the outset that in nearly all the dermatoneuroses there exist disorders of sensation more or less pronounced (hyperæsthesia, dysæsthesia, anæsthesia, etc.).

In this chapter we have in view only the dermatoneuroses of pure sensation, that is, those in which there are no appreciable lesions of the skin. But it must be noted that often, in consequence of the mere change in cutaneous sensibility, secondary lesions of the integument may be produced. Undoubtedly the vasomotor and trophic disturbances resulting from an alteration of cutaneous innervation play a certain part in the production of the secondary lesions of the skin. It is no less true that the surface excitation resulting from pruri-

ginous hyperæsthesia (scratching, rubbing, etc.), or the exaggerated traumatism which the anæsthetic skin endures, plays a part in the production of certain modifications of the cutaneous surface in consequence of these disorders of sensation. But we must not attach an exaggerated importance to what has been written on this point by Brocq and Jacquet " who have reported cases where the cutaneous eruption either disappeared or was ameliorated under the influence of the protection, although the pruritus was in no way lessened by the covering.

The special susceptibility of the central or peripheral nervous system does not ordinarily suffice to explain by its influence alone the appearance of a cutaneous eruption. This usually appears only under the influence of some superadded action—a mental shock, nerve irritation, reflex or otherwise, some external poison or autointoxication, a traumatism, etc.

The pruritus, as I have demonstrated in 1885, often precedes the cutaneous lesions, and is frequently the cause of them.

How often one sees an eruption of eczema, lichen, or simple urticaria, preceded for several days or even weeks by pruriginous phenomena, of a tenacity sometimes extreme! I could cite numerous examples, but will take only one. I choose that because it occurred in my own person, and consequently I was able to observe it closely.

In 1885, over-fatigued by work, I was seized with a lively itching upon the dorsal aspect of the thumb and index finger. This itching, which was almost continuous, increased at intervals, and during these exacerbations, lasting usually for several hours, it became almost intolerable. These pruriginous crises ordinarily appeared in consequence of an excess of mental labor. For five days I could not discover any apparent cutaneous lesion. But about this time there appeared upon the dorsal aspect of the thumb and index finger a papular and vesicular eruption, which quickly took on the aspect of an eczema. This eruption lasted several months, in spite of vigorous local treatment, and disappeared entirely only under the influence of fresh air, physical exercise, and mental rest.

At the time of this first attack I was sure that the traumatism, the scratching consecutive to the pruritus, irritated the eruption, which, nevertheless, did not appear till five days after the beginning of the pruritus. I noticed besides that the use of gloves (it was then February) caused the pruritus as well as the eruption to diminish. The trouble was increased, on the other hand, when I went from a hot room into the cold air, and especially from cold into hot air, when I washed my hands—in a word, whenever I exposed the ailing parts to some cause of irritation.

But in 1887, when seized under the same circumstances by a similar attack, I refrained from scratching for three days, and placed myself as far as possible under protection from external injury; nevertheless, at the end of these three days there appeared an intense eruption of papulo-vesicular eczema upon the dorsal surface of the thumb and index finger. This eruption persisted again for several months—four, I think—and I was able to conquer it only by a change of life and surroundings (fresh air, physical exercise, and mental rest).

In this case the pruritus, without the irritation produced by scratching, was followed by the appearance of a papulo-vesicular dermatoneurosis. The scratching played no part, and we cannot therefore put this down as a case of eczematization or of lichenification produced by the scratching excited by a pruritus. I could cite other similar cases.

These facts seem, then, to prove that in certain cases pruritus alone without the intervention of external traumatism, may be followed by an eruption lasting a considerable time. But more often the appearance of the eruption, when it shows itself, seems to be favored by the scratching and external traumatism. These undoubtedly play a major part in its appearance, and it is necessary before everything else, whatever may be the variety of the neurosis of the skin which one has under consideration, to protect it from contact of the air or of irritating external agents, and from rubbing.

To Jacquet belongs the credit of having insisted upon the action of protection in pruriginous affections, and of having clearly shown experimentally that a number of pruriginous diseases of the skin, urticaria, certain forms of lichen, etc., were nothing else than neuroses of the skin accompanied by an eruption. He has clearly demonstrated that if, in the case of an intense and general urticaria, the skin is completely protected from external influences by a covering of wadding, the pruritus and the urticaria disappear. According to him, therefore, all the urticarias are, properly speaking, factitious and artificial."

Are the other pruriginous dermatoses of the same character?

The researches of Jacquet were the incentive to numerous investigations by Brocq, Jacquet, and Besnier as to the nature of pruriginous dermatoneuroses. Brocq and Jacquet, in a series of important memoirs, have increased our knowledge concerning the rôle played by scratching and traumatism in certain varieties of pruriginous dermatoneuroses, and, in particular, in certain lichens and lichenifications of the skin.

Recently Brocq has published the results of his clinical investiga-

tions concerning the lichenifications of the skin in certain pruriginous dermatoneuroses, and has explained a number of facts interpreted hitherto imperfectly. In a word, Jacquet, Brocq, and Besnier ascribe to scratching and external traumatism an important part in the production of the eruptions consecutive to certain forms of the pruriginous dermatoneuroses, a part upon which dermatologists in general do not sufficiently insist even at the present time.

Anæsthesia may also be the indirect cause, through the traumatism to which it exposes the skin, of certain lesions, the most common of which are the erythemata, cutaneous hemorrhages, phlyctenulæ, ulcerations, and even gangrene. As I demonstrated in 1885 regarding the secondary eruptions, here again it has been shown that protection of the cutaneous surface suffices, in the majority of cases, to check the secondary lesions of the skin.

No better example of this could be given than the well-known experiment in which the cornea, which had been rendered anæsthetic by divison of the trigeminus, was protected by closing the lids of the eye, and by fixing before it an ear of the animal, in order to allow him by means of the sense of touch to escape any injury to this eye; in this way, ulceration and necrosis of the cornea were prevented.

The celebrated experiment of Brown-Séquard is still more suggestive from a dermatological point of view. The theory of the action of external injuries in the production of the lesions of the skin secondary to lesions of the nervous system, and of the part played by occlusive dressings in the prevention of the elementary cutaneous lesions resulting from traumatism, is found there. Brown-Séquard, after cutting the sciatic nerve, proved that ulceration of the limb secondary to this nerve section could be prevented or retarded, if traumatism could be avoided by protecting the injured member by means of a wadding dressing.

Finally, we may remark that these disorders of sensibility may, like all centripetal excitation of the central nervous system, be the origin of reflex dermatoneuroses in subjects who are predisposed. A pruritus, localized at first at one point, may cause the production of new pruriginous foci, and even of a general pruritus, which may or may not be followed by secondary lesions of the skin.

The anæsthetic hemiplegias constitute a remarkable example of the part taken by a localized pruritus in the production of a more or less diffuse pruritus, and of the secondary eruptions. When a patient suffering from the itch or pruriginous eczema develops anæsthetic hemiplegia, the phenomena consecutive to the pruritus and to the scratching[1] (*dermatoneuroses para-galeuses*) are observed only on the healthy side, while upon the hemiplegic side nothing similar

will be noticed. Likewise, if, in connection with an anæsthetic hemiplegia, a pruriginous dermatoneurosis develops on the healthy side, it may cause, by reflex action upon that side, pruritus and more or less diffuse secondary dermatoneuroses, but the hemiplegic side will remain intact. In the admirable lectures of my teacher, Vulpian, upon the vasomotors may be found remarkable examples of these reflex neuroses of the skin.

In order to suppress this reflex pruritus and the eruptions which may arise in consequence, it is necessary to attack at once the starting-point of the cutaneous reflex; and the same is true concerning all the reflex neuroses of the skin, whatever may be their origin (uterine, gastro-intestinal, etc.). What more beautiful example of this could there be than the pruritus, quite generally followed by an eruption resembling nettle rash, prurigo, lichen, or eczema, observed frequently among children in the course of the eruption of the teeth, and which have as a starting-point the pruritus of the gums! The checking of this pruritus by rubbing the inflamed gum with the finger, the application of a cocaine solution, of the bromides, or, better still, of the tincture of iodine, will often cause this more or less general reflex pruritus and the eruptions which result from it to disappear.

Finally, it must be noted that, just as all the other lesions of the skin of nervous origin, the pruriginous dermatoneuroses may also be inoculated with the agents of suppuration which may complicate the eruption. The protection of the skin therefore plays an important rôle not only in the prevention of the pruritus and of the secondary dermatoneurosal eruption, but also in the prevention of their inoculation with pathogenic agents.

We will now proceed to the study of the different disorders of cutaneous sensibility.

Increased Cutaneous Sensibility.

This comprises: (1) Idiopathic pain of the skin, or dermatalgia; (2) hyperæsthesia; and (3) pruritus.

Dermatalgia.

By the term dermatalgia we designate pain idiopathically manifested in the skin. This idiopathic character permits us to distinguish dermatalgia from cutaneous hyperæsthesia, where an external impression, however light it may be, is necessary to produce the hyperæsthetic phenomena.

As Arnozan has very well said," to feel pain spontaneously and to suffer it in consequence of a slight impression which in a normal state

would produce no effect are two different physiological acts. The one will always be announced by the patient himself; the other can frequently be discovered only by methodical investigation. Doubtless they often come together at certain points; often also it will be difficult to discern whether the pain in a given case is truly idiopathic or whether it is dependent upon a very feeble excitation (contact with the air, temperature, etc.). In most cases, however, the distinction can be made.

Besides, dermatalgia is frequently associated with the other forms of modification of cutaneous sensibility, particularly with anæsthesia. When a nerve is inflamed, irritated, or cut, the resulting stimulus causes a pain which is referred, as all other sensations, to the periphery (dermatalgia); but it has become impossible to transmit to the centres through this injured nerve trunk any sensitive impressions (anæsthesia).

The pain of dermatalgia can be of various forms, and it will be perhaps interesting to study them separately. But, as Rendu has observed, prickings, tingling, shooting pains, sensations of cold, of heat, of smarting, or of burning, are evidently manifestations which have each its own significance, but which cannot be analyzed, for they depend exclusively on the statements of the patients. The majority of these appreciate the symptoms badly, exaggerate them, and do not know how to make any distinction.[18] Pruritus is a special sensation, not a true pain, which, on account of its special characters—the nature of the reflexes which it causes and its importance dermatologically—merits a special place in the study of the exaltations of cutaneous sensibility.

The dermatalgias appear in the course of several lesions of the skin. We need not enter upon these here, referring the reader for their consideration to those dermatoses of which the pain is a symptom. But it is necessary to say a few words concerning the dermatalgias occurring in rheumatism, for they take on an almost special character. In addition to the pain manifestly dependent upon lesions of the skin, rheumatism may excite dermatalgia without there being any other symptom than the pain to reveal its location in the skin. These rheumatic pains of the skin, first described by Beau, were for a long time almost the only affection studied under the name dermatalgia.

They occur especially in cases of obscure rheumatism. "Some of these patients," says E. Besnier,[19] "feel painful sensations of a shooting character, and especially multiple prickings, which invade all or a part of the integument, like sparks travelling through the skin. In others there is a true dermatalgia, transitory or per-

manent, localized most frequently upon the head, the trunk, and the lower limbs."

The dermatalgias arising in the course of irritations of the nerves have been studied by Weir Mitchell. I cannot do better than to present here his description. "When the later pathological changes of an irritative nature which follow nerve injuries begin to occur, new causes of pain arise, the reflex references become wider, and when in certain cases the nutrition of the skin suffers, novel forms of suffering spring up, which are due to alterations of the peripheral nerve ends or their protective tissues. . . . In delineating this form of pain, perhaps I cannot do better than transfer to these pages the account originally written while I was seeing almost daily numbers of persons suffering as I have described them: 'In our early experience of nerve wounds, we met with a small number of men who were suffering from a pain which they described as a "burning," or as "mustard red-hot," or as a "red-hot file rasping the skin." In all of these patients, and in many later cases, this pain was an associate of the glossy skin previously described. In fact, this state of skin never existed without burning pain. Recently we have seen numbers of men who had burning pain without glossy skin, and in some we have seen this latter condition commencing. The burning comes first, the visible skin change afterwards; but in no case of great depravity in the nutrient condition of the skin have we failed to meet with it, and that in its forms of almost unendurable anguish.'"

The writer noted that this pain appears during the healing of the wound; that it may be in the territory of the injured nerve, or in that of neighboring nerves; that it attacks by preference the palms of the hands and the dorsal aspect of the foot, never the trunk.

"The great mass of sufferers described this pain as superficial, but others said it was also in the joints, and deep in the palm. If it lasted long it was finally referred to the skin alone. Its intensity varies from the most trivial burning to a state of torture, which can hardly be credited, but which reacts on the whole economy, until the general health is seriously affected. The part itself is not alone subjected to an intense burning sensation, but becomes exquisitely hyperæsthetic, so that a touch or a tap of the finger increases the pain. Exposure to the air is avoided by the patient with a care which seems absurd, and most of the bad cases keep the hand constantly wet, finding relief in the moisture rather than in the coolness of the application. Two of these sufferers carried a bottle of water and a sponge and never permitted the part to become dry for a moment.

"As the pain increases, the general sympathy becomes more marked. The temper changes and grows irritable, the face becomes

anxious, and has a look of weariness and suffering. The sleep is restless, and the constitutional condition reacting on the wounded limb exasperates the hyperæsthetic state, so that the rattling of a newspaper, a breath of air, another's step across the ward, the vibrations caused by a military band, or the shock of the feet in walking, give rise to increase of pain. At last the patient grows hysterical, if we may use the only term which covers the facts. He walks carefully, carries the limb tenderly with the sound hand, is tremulous, nervous, and has all kinds of expedients for lessening his pain. In two cases, at least, the skin of the entire body became hyperæsthetic when dry, and the men found some ease from pouring water into their boots. They said, when questioned, that it made walking hurt less; but how or why, unless by diminishing vibration, we cannot explain. One of these men went so far as to wet the sound hand when he was obliged to touch the other, and insisted that the observer should also wet his hand before touching him, complaining that dry touch always exasperated his pain.

"Cold weather usually eased these pains; heat and the hanging down of the limb made them worse. Motion of the part was unendurable in some of the very worst cases; but, for the most part, it did no harm, unless so excessive as to flush the injured region." [10a]

Such phenomena well merit a special name, and that of *causalgia*, which has been given them by the American authors, is extremely appropriate. It is not necessary to suppose that causalgia belongs specially to traumatic neuritis. In the remarkable work of Tédenat upon Frostbite are found several examples of causalgia consecutive to frostbite of long standing. The cutaneous pains, the glossy and shining appearance of the skin which is at the same time atrophied, thin, and congested—in a word, all the symptoms indicated by Weir Mitchell are here described.

Sometimes the patients do not complain of burning heat, but of an icy coldness; others seem to have added to their local pains true fulgurating pains. Disorders of tactile sense are associated with the spontaneous pains. Hyperæsthesia is the rule; sometimes, exceptionally, it coincides with integrity of tactile sensation, but usually the latter is defective. Finally, thermal sensations are almost always exaggerated, lessened, or perverted, although it has not been possible to determine, up to the present time, what causes the changes in them (Arnozan).

Dermatalgia is frequently a symptom of trophic lesions of the skin. It may be in these cases of certain diagnostic importance. As Arnozan has remarked, the trophoneuroses are often accompanied by pains disproportional to the anatomical lesion. This dispropor-

tion between the depth of a skin lesion and the pain accompanying it ought always to cause an investigation into the state of the nervous system for the origin of a dermatosis whose etiology is doubtful.

Dermatalgia may be observed in the course of the various spinal diseases, and especially of locomotor ataxia. It must be noted at the outset that the investigations of Déjerine and of Pitres, by showing that lesions of the peripheral nerves are present in those suffering from ataxia, have proved what an important part these play in the production of the ataxic dermatalgias.

Dermatalgia often accompanies either hyperæsthesia or anæsthesia. It may, perhaps, follow trophic lesions of the skin. It plays a large part in the symptomatology of hysteria.

Briquet and Axenfeld have called attention to the sensations of severe cold, of burning heat, of tinglings, etc., of which the hysterical complain. Brodie has shown that in the hysterical coxalgias and paraplegias the pain attacks the skin especially. If this is pinched so as slightly to raise it from the subjacent portion, the patient complains of more pain than if the femur is pushed against the cotyloid cavity, or if the apophysis is percussed—an important sign, which may put one on the track of a diagnosis.

As Charcot has pointed out, dermatalgia plays an equally important rôle in the false peritonitis of the hysterical. Hysterical dermatalgia is always accompanied by hyperæsthesia, and is very irregular in its course. Finally, dermatalgia is frequent in the course of the different varieties of mental alienation. A study of the reflex dermatalgias has yet to be made.

Hyperæsthesia.

Hyperæsthesia is an exaggeration of the sensibility of the skin.

In hyperæsthesia, the intervention of an external cause, however slight it may be, is necessary to excite the painful symptoms; while, on the other hand, in the dermatalgias, as Arnozan has very correctly stated, the patient carries in his tissues or organs disorders sufficient to excite the nervous system to the point of feeling pain. Hyperæsthesia and dermatalgia, however, often coincide.

There are two varieties of hyperæsthesia which must be distinguished from each other. The first will require only a passing notice. It is an ideal hyperæsthesia, consisting in such a modification of sensibility that the perceptive centres receive more acute impressions from contact with external bodies, and judge with more delicacy the character of their impressions. This first variety of hyperæsthesia is, as Gilbert Ballet correctly says, a truly perfected

sensibility. It is observed in the degree of greatest development and completeness in hypnotic sleep, particularly in that condition which Charcot designates by the name of the somnambulic state. The sensitiveness becomes, then, as many authors have demonstrated, remarkably acute. The least breath or a slight current of air causes shivering.

Phenomena similar to the preceding may be observed in the course of certain mental diseases, as Marcé has shown. Also certain forms of intoxication (hasheesh, alcohol) may cause similar phenomena.

The second variety, which is much more frequently seen than the other, and which should especially engage our attention from a dermatological standpoint, is the painful hyperæsthesia which is characterized by a more vivid impressionability of the skin, coupled often with less power of distinguishing the qualities of the agents producing the impression. The greater acuteness of sensibility is manifest here by pain and not by tactile impressions, which, on the contrary, are more or less blunted. As Charles Richet remarks, as soon as the hyperæsthesia appears the tactile sense loses its acuteness.

Weir Mitchell, and afterwards Richet, by compressing or freezing the ulnar nerves in the epitrochlear groove, produced a lancinating pain, soon followed by swelling in the cutaneous territory of the nerve. This pain is more or less severe, but is not accompanied, at least in the beginning, by abnormal sensations. Thus, freezing does not cause a sense of cold in the parts to which the nerve is distributed. In a word, the excitation of a nerve filament does not cause the pain. This is the explanation of the pains that are sometimes felt, as if in the lost member, by those who have suffered an amputation, although the patients may not complain of painful contact, nor of fatiguing compression of the stump. These pains, accompanied sometimes by tactile sensations, are not caused by exaltation of the nerve, but seem to belong especially to irritation of the nerve terminations.

Hyperæsthesia may affect a small or considerable portion of the surface of the skin. It may involve the whole of one side of the body, as is observed in hysteria, or become general, as in certain cases of spinal irritation and neurasthenia. Cazenave[29] relates the case of a man whose entire skin was in such an irritable condition that he could endure only very loose and light clothing.

I knew a patient, who had become neurasthenic on account of excess of mental work and prolonged sorrow, whose skin was the seat of the most intense hyperæsthesia, appearing in paroxysmal attacks. In the intervals of these attacks the hyperæsthesia, which had involved the whole body except the head, the neck, the legs, and the

feet, was relatively endurable, and consisted of a sensation of heat, which contact with objects would increase more or less. But when the attacks appeared (and these came on irregularly), the hyperæsthetic symptoms became unbearable. They were located generally in the abdominal region, but at times were felt with greatest intensity on the back and upper limbs, very often on the buttocks and thighs, and in such cases they rendered all manual labor practically impossible. These paroxysms of hyperæsthesia came on suddenly, like an electric shock. All at once the parts affected, as the result of the least touch or slightest pressure, would become the seat of prickings, dartings, and sensations of burning, so intolerable that the patient writhed with the pain, at the same time uttering pitiful cries. The only thing which soothed these paroxysms for an instant was an immersion for one or two hours in a lukewarm bath. With great difficulty, at the end of ten months, I succeeded in curing this patient by the application of compresses of chloroform upon the hyperæsthetic parts, by lukewarm spinal douches, by the prolonged use of valerianate of ammonia, quinine, the bromides, and arsenic, by hygiene, mental rest, and electrotherapy.

I could multiply these examples. I would add that in several of these observations the hyperæsthesia was at certain times accompanied by a more or less transitory erythema, resembling, except for its duration, ordinary blushing. In one case this erythema, or, better, this congestive state of the skin, which followed hyperæsthesia of intense character (also accompanied by an arthritic neurasthenia), became permanent, involved the whole cutaneous surface, and gave to the patient who was thus afflicted a red, congested appearance, resembling that of a boiled lobster.

In other cases the hyperæsthesia is limited to spots of varying extent, but not exceeding some centimetres (an inch or two) in diameter. Frequently these hyperæsthetic spots are accompanied by anæsthesia, as is observed in locomotor ataxia. In nervous leprosy also there may be spots of hyperæsthesia, usually accompanied by anæsthesia.

Hyperæsthesia varies greatly in its clinical characteristics. If the hyperæsthetic spot is rubbed, there is ordinarily produced a well-marked sensation, though generally poorly defined, which is often painful. At other times there are sensations of heat, of burning, of cold, of tickling, of pricking, or of itching. As I sometimes remark in my clinics, one might say that the subjects afflicted with hyperæsthesia have their nerves on a level with their skin. These sensations are, moreover, very variable, as to both intensity and duration. They may be temporary or permanent, whatever the cause which produces the hyperæsthesia.

Finally, for the production of the hyperæsthesia, an intense external irritation is sometimes required; at other times it is caused by a very slight influence.

At times, especially among tabetics and in the course of certain forms of peripheral neuritis, the hyperæsthesia affects only the sense of temperature. The contact of a hot object, and especially of a cold one, causes a most painful sensation. It is not uncommon to observe this symptom in the regions of the skin affected by anæsthesia and complete analgesia, which proves again the intimate relatons existing between anæsthesia and hyperæsthesia.

Etiology.

The causes of hyperæsthesia are very numerous. It may depend upon a functional trouble or upon various lesions of the central or peripheral nervous system. It frequently occurs in the course of the neuroses (hysteria, neurasthenia, etc.), mental diseases, lesions of the peripheral nervous system, affections of the brain, and of the spinal cord. Chronic poisoning by lead, arsenic, alcohol, carbonic acid, etc., produces some disorders of sensibility, and among them hyperæsthesia has been observed. Racle has even described a form of alcoholic hyperæsthesia in which the least touch causes atrocious pain.

Moreover, in these different forms of chronic poisoning, the hyperæsthesia is without doubt often due to peripheral neuritis. The ingestion of certain poisons is followed sometimes by intense hyperæsthesia. It can be said, finally, that hyperæsthesia constitutes one of the principal symptoms of acrodynia."

We need not speak here of the hyperæsthesia occurring in the course of skin affections, contenting ourselves by making the observation that, in a general way, this hyperæsthesia is far from being always in proportion to the severity of the cutaneous lesion; that one may see deeply destructive diseases of the skin, such as lupus, for example, existing almost without pain, while other diseases of the skin, more superficial in character, such as certain forms of herpes, zona, certain pemphigoid eruptions, and nervous leprosy, may sometimes be accompanied by very intense hyperæsthesia.

Hyperæsthesia would appear to be observed with especial frequency in the trophoneuroses.

PRURITUS.

Pruritus is a dermatoneurosis characterized by the production of itching, and not accompanied, primarily at least, by appreciable lesions of the skin.

This definition applies to pruritus properly so called, and not to the pruritus symptomatic of most of the dermatoses with which we have nothing to do here.

That which characterizes true pruritus is that it is not consecutive to any lesion of the skin, appreciable, at least, with our present means of investigation. The itching constitutes the sole symptom. This itching, moreover, varies both as to its nature and intensity. It appears ordinarily in paroxysms, in crises more or less frequent, caused often by changes in temperature, the warmth of the bed, errors of diet, poisons, auto-intoxication, traumatisms, excessive mental or physical exertion, a too sedentary life, insomnia, sorrow, mental shock, etc.

Usually the itching begins in a limited portion of the body. It may remain localized, but often extends, involving each side symmetrically, and may become general under the influence of reflex excitation.

Whether the affection proceed rapidly or slowly, it almost always culminates in an itching of great intensity. The patient is irresistibly compelled to scratch, and if he cannot satisfy this desire to scratch, he shows an anxiety and suffering that are pitiful. Anything answers for scratching—the hand, the nails, the clothing, which he rubs upon the itching parts, sometimes even a brush, a piece of wood, or any object that is at hand.

In many cases the scratching aggravates the pruritus, makes it more intense, more persistent, and more extensive, by increasing the reflex irritation. Usually the skin is dry, but in certain cases there appears profuse perspiration, especially in the axillæ and inguinal folds and on the face, which has been considered due to a reflex irritation of the nerves which control the perspiration.

Hardy has called attention to a symptom among women suffering from pruritus which it is difficult to explain on any other ground than reflex action. In two women, not nursing, and neither having had a child for more than ten years, an abundant secretion of milk appeared some time after the pruritus, and seemingly in consequence of it. I have observed a similar phenomenon in a young girl, about seventeen, suffering from an intolerable pruritus of the vulva. In this young girl, arthritic and very nervous, the pruriginous exacerbations were frequently followed by a sense of tension and engorgement of the breasts, soon accompanied by a scanty secretion from the nipple of an opalescent liquid resembling milk.

Moreover, pruritus may cause reflex phenomena not only in the cutaneous and glandular system, but the reflex irritation of the motor system may be so excited as to cause convulsions. I have, for example, seen convulsions in children following pruritus of the gums.

But it must be stated also that frequently the itching ceases when the patient has caused excoriation of the skin. In these cases where bleeding excoriations have been produced, pain takes the place of the pruritus, and the sufferer much prefers this to the agonizing itching which tortured him.

It is generally during the night that the pruritus attains its maximum intensity. There are subjects who pass the whole night scratching and digging the skin with their nails. In the morning only, worn out by fatigue, are they able to obtain a short period of rest. Certain sufferers, by the exercise of extreme efforts of the will, are able to refrain from scratching while they are awake, but if they fall asleep, the pruritus induces scratching, and they scratch themselves furiously during their sleep, and awaken excoriated and bleeding.

Other patients suffer from the pruritus only during sleep, and scratch themselves only at that time. These subjects affirm with the utmost confidence that they do not suffer from itching, and they are astonished when they behold the numerous excoriations which they have produced upon their skin. This variety of pruritus is the unconscious pruritus, and, though rare, it is important to be able to recognize it.

Usually the skin does not present any changes, except those which are produced by the scratching, and even these may be slight and out of all proportion to the intensity of the scratching. Sometimes the red streaks remain visible some minutes or longer in dermographic subjects. Quite frequently the integument is dry and rough. Occasionally, secondary to the pruritus and the scratching, various lesions of the skin appear.

As we have just said, scratching plays an important rôle in the production of the different cutaneous changes secondary to pruritus, and Jacquet has rightly insisted upon the importance of recognizing the influence of scratching in the production of these eruptions. But it is no less true, as I have shown, that the pruritus alone may be the cause of various cutaneous affections.

Besides, if these external irritations, such as traumatism, rubbing, and scratching, are the sole cause of these post-pruriginous changes in the skin, how is it explained that certain forms of pruritus, of an intensity sometimes extreme—for example, pruritus senilis and pruritus of the genital organs—are not followed by a dermatitis in spite of an incessant scratching?

Thus Brocq and Jacquet [11] were obliged to turn for the explanation of these cutaneous eruptions consecutive to pruritus to the vasomotor and trophic theories which I have set forth in my works upon

the dermatoneuroses published since 1879. They write: "In the pathogeny of the neurosis of the skin, whose study we are undertaking, there are doubtless several causal elements. One of them, viz., pruritus, has been recognized, but incompletely. Yet certain others escape us, for example, the trophic influence, the nervous influence which controls the vasomotor equilibrium, etc.—all actions which are not visible, but which we recognize by their effects. But as these nervous acts are not associated with pruritus, the effects upon the cutaneous zone subject to the irritation aroused by the pruritus may vary from a functional, fugacious hyperæmia to the lasting lesions of dermatitis. There will be no tendency in any degree to the formation of visible changes of the tissues. Thus it is perhaps explained why certain neuroses of the skin are not accompanied by permanent lesions, while others seem to have a natural inclination to form such lesions."

No more correct statement can be made than that these lesions of the skin consecutive to pruritus are, as I have taught and written since 1885, tegumentary neuroses, pruriginous dermatoneuroses followed by eruptions. In a word, there exist some pruriginous affections of the skin which, during the whole course of their evolution, are not accompanied or followed by the slightest eruption; there are others which *may* be followed by changes in the skin. These are the conditions to which Brocq has given the names neurodermia and neurodermatitis.

When the pruritus and the scratching, which is its consequence, end in the production of cutaneous lesions, the symptoms of hyperæmia often appear, with a tendency to the formation of the papules of urticaria. Sometimes there appears also a sort of goose-flesh condition. In a more advanced state, a chronic dermatitis comes on. As Jacquet has clearly demonstrated, "the skin, infiltrated slowly by the embryonic elements, is thickened and becomes hard and rough; the papillæ become hypertrophied and group themselves after the manner of quite irregular and unequal papules. After a time, more or less long, the skin presents an appearance specially characterized by the increase of the natural epidermis, which forms a quadrangular marking, with more or less wide and regular meshes; and by an infiltration, more or less marked, of the skin, which has lost its suppleness and normal consistence." It is to this morbid process that Brocq has given the name "lichenification."

This lichenoid condition varies considerably in appearance, and we can do no better than to refer the reader to the excellent treatise of Brocq upon the pruriginous dermatoses and the lichens.

In certain cases there is found a mixture of lichenification and

eczematization. It is thus that we see the pruriginous dermatoneuroses end in the formation of papules, of a lichenoid condition of the skin, and of different affections united under the name of lichen, as Cazenave demonstrated in 1846 in his excellent articles upon the disturbances of sensibility of the skin."

In pruriginous dermatoneuroses of long standing, it is not uncommon to observe a pigmentation of the skin, a hyperchromia, sometimes quite intense and extensive, and even general, a hyperchromia which will persist for a longer or shorter time, according to circumstances.

Pruritus is always a serious disease, which in consequence of the resulting insomnia, loss of appetite, and nervous irritation, may culminate in nervous exhaustion, neurasthenia, mental depression or exaltation, or sometimes even lead to insanity and suicide.

Senile pruritus is incurable and lasts as long as life.

Etiology.

The causes of pruritus are numerous. Certain temperaments, such as the arthritic, the nervous, and the gouty, are particularly predisposed.

Among the causes of pruritus, mention must be made of gastro-intestinal and hepatic diseases, which irritate the nervous system (largely on account of the auto-intoxication which they produce), chronic nephritis, diabetes, and icterus, all of which probably act in the same manner. In some cases it is tuberculosis or carcinoma of the intestinal tract or of the liver which is the cause of the pruritus. Frequently the pruritus precedes for a long time the development of these diseases.

I call to mind the case of a handsome and robust young woman, of twenty-seven years, in whom a pruritus, quite general and very persistent, which was followed only from time to time by a very mild reaction of the skin, resembling urticaria, preceded for nearly a year an acute tuberculosis, communicated to her by her husband, who was suffering from chronic tuberculosis. In other cases, as I have shown,[3] a pruritus of this description may also appear as the primary manifestation of a nervous disease, at the period of so-called incubation, forming one of the series of affections which I have designated under the name of *dermatoneuroses indicatrices* (the indicator neuroses of the skin).

Sorrow and mental shock are powerful causes in the production of the pruriginous dermatoneuroses.

Pruritus is often observed in the course of the various intoxications—alcoholic, carbonic oxide, malarial, mercurial, etc.

Finally, in some predisposed subjects, pruritus may arise in consequence of more or less prolonged irritation of the skin, of either mechanical or pathological origin. I have seen, for example, a sometimes very persistent pruritus coming on a very long time after an attack of the itch, and which I have studied in detail under the name of "dermatoneuroses para-galeuses," in my lectures on itch.

In regard to senile pruritus, its pathogeny is not yet fully determined, and while it appears to be favored in its development by the retrogression of the dermo-epidermal elements, it must not be forgotten, as E. Besnier has well remarked, that the possible existence of Bright's disease, glycæmia, various toxæmias, polyuria, carcinoma of the liver, or finally and especially, senile kidney, renal insufficiency, or the arthritic or gouty diathesis, ought always to be present in the mind of the physician when called upon to treat a case of senile pruritus.

It should never be forgotten that among women pruritus may develop during the menstrual period, and that it is often associated with sexual disorders or with diseases of the uterus and ovaries at the menopause.

Pruritus takes its origin in some disease of the genital organs, in men as well as in women.

The possibility of a reflex pruritus must always be present in the mind of the physician. The forms of pruritus secondary to diseases of the olfactory organs have been pointed out by the rhinologists. Pruritus due to the presence of intestinal parasites is very common, and I have observed some remarkable examples while in Algiers. Finally, the pruritus depending upon the eruption of a tooth is, as has been stated, very frequent, and ought always to be thought of by those who take care of children.

Varieties.

Several varieties of pruritus are recognized. They may be divided into two groups, according as they are general or local.

Pruritus Senilis.—This is the type of generalized pruritus. It is certainly the most serious form of the pruriginous dermatoneuroses. It usually develops after the sixtieth year, causes an incessant and atrocious itching, which constantly torments the sufferers, produces insomnia, dyspeptic disorders, neurasthenic phenomena, and may, in certain cases, even lead to self-destruction.

I have seen patients whose nails and fingers, on account of the continual scratching, had become in a manner eburnated, the nails having been in great part worn away, and the fingers presenting the appearance of drumsticks, smooth and polished.

A remarkable thing is that, despite this continual, atrocious, uninterrupted pruritus and the resultant scratching, the skin does not ordinarily present any visible eruption—neither an urticaria nor a lesion of scratching is present. The skin is generally dry, and is sometimes slightly pigmented. More rarely, a mild degree of lichenification is present.

Senile pruritus is of indefinite duration. This character of duration, as E. Besnier and Doyon remark, is of the highest importance. Even in an old man a recent pruritus, accompanied by the lesions of scratching, ought not to cause a too hasty diagnosis of pruritus senilis; it is often something else. Fewer cutaneous lesions and a longer duration are necessary to establish a positive diagnosis of senile pruritus, in which, according to our observation, there are no real lesions of the skin, unless a complication, renal or otherwise, is present, or they have been caused by irritant applications. I repeat, if we find in an old person manifest cutaneous changes developed within a few weeks, and the lesions of scratching well marked, the chances are that the affection is a prurigo from divers causes, parasitic, etc., and not a true senile pruritus.[24]

Senile pruritus is a most rebellious disease, and, unhappily, we are almost powerless to relieve it.

Pruritus Hiemalis.—To Duhring belongs the honor of having described, under the name of pruritus hiemalis, an affection characterized essentially by itching, occurring during the cold season.

As Besnier and Doyon have justly observed, the precise time in the season when the malady appears varies in different years and in different countries; but it is in general at the time the first cold spells appear, when the cutaneous perspiration suffers a diminution, which has not yet been regularly compensated for by an increase in the urinary secretion.

In pruritus hiemalis the itching is located especially upon the extensor surface of the lower limbs and their external aspect, but the entire body may be involved.

The pruritus is increased as soon as the patient undresses and gets into bed. Changes in temperature often cause an increase in the itching. During the day, while the patient is well protected by his clothing and his attention is otherwise occupied, he does not suffer. With many subjects this disorder remains of a mild character; with others it acquires considerable intensity, causing nervousness and insomnia. Among certain sufferers it may be the origin of eczematous lichenoid eruptions, but these complications are rare.

Pruritus hiemalis is observed especially among nervous arthritics.

The duration varies from several weeks to several months. It generally disappears before the end of the cold season.

Pruritus Generalis.—L. Duncan Bulkley has described, under the name of *pruritus generalis*, a form of pruritus which occurs often during the cold season, but which soon loses its character of pruritus hiemalis, for it continues during the warm season, with exacerbations and remissions independent of the temperature and seasons.

Its pathogeny is not well known. In some patients the urine has been found to contain a large quantity of urates and oxalate of lime, and other subjects were rheumatic.

The following are the different forms of local pruritus most frequently encountered.

Pruritus ani (prurigo podicis) is characterized by violent itching seated at the anus or its margin, and also in the rectal mucosa.

This pruritus occurs principally in paroxysms at night. When the pruritus extends into the interior of the rectum, the sufferers, in order to relieve themselves, introduce the finger into the opening of the intestine, and sometimes objects harder than the finger and of greater volume. The patients scratch and rub themselves vigorously. In some cases, after the scratching, there appears at the anal orifice a serous exudation, which produces a relief from the itching, and is accompanied sometimes by a voluptuous sensation.

The scratching produces eczema, lichenification, and hyperchromia of the anal and perianal region, rectal catarrh, and even excoriations and fissures.

Pruritus ani is observed especially as a complication of various affections of the digestive tract or its adnexa, and of the various nervous diseases. It is found frequently among the gouty, the diabetic, and those suffering from uræmia and autotoxæmia. Errors of diet may excite it; alcohol, coffee, tea, and tobacco increase it. It may be developed under the influence of divers local causes, such as hemorrhoids, fistulæ, anal fissures, strictures of the urethra, intestinal parasites, etc.

Pruritus vulvæ, which must not be confounded with the numerous prurigos, lichens, and eczemata of the vulva, due often to contact with urine, sweat, vaginal secretions, etc., is, like pruritus ani, a very rebellious affection. It is manifested by excessively violent itching of the cutaneous genital parts, principally the labia. The pruritus extends sometimes into the vagina. The sufferers are not able to resist the desire to scratch, and as the scratching brings relief, and even a kind of orgasm, it often results in the habit of masturbation.

As with pruritus ani and the pruritus of the external genital organs in man, the causes of pruritus vulvæ may be the same as those of general pruritus. It is principally encountered among women at the time of the menopause, and in those of an arthritic or nervous type.

Diseases of the uterus or ovaries, and of the vagina, play an important rôle in its production. It is sometimes premonitory of diseases of these organs, and particularly of carcinoma of the uterus. It is sometimes a symptom of hysteria. But it must not be forgotten that it is very often dependent upon changes in the urine, and particularly diabetes.

After a certain time, the scratching which is the result of the pruritus produces an eczematous or lichenoid dermatitis, ulcers, fissures, and even a semi-solid œdema of the affected parts, resembling elephantiasis. It may also excite a vaginal catarrh.

Pruritus of the Male Genital Organs.—Pruritus of the external genitals in man attacks especially the scrotum at the border of the perineum. It may involve the glans, the meatus urinarius, or even the urethral mucosa.

In a case of intense pruritus extending to the glans penis, the meatus, and the urethral mucous membrane, occurring in a man fifty years old, of a nervous, arthritic temperament, which I had occasion to observe, the sufferer, in order to allay the horrible paroxysms of itching which tormented him, would introduce into his urethra, to a depth of five or six centimetres, a pen-holder or a pencil, which he moved with frenzy.

As in all the forms of local pruritus, the itching may be continuous, but more often there occur exacerbations, during which the desire of the sufferer to scratch himself is so urgent that he is obliged to satisfy the demand in whatever place he may be. The courts sometimes condemn, as guilty of a sexual offense, a sufferer from pruritus of the anus or genital organs, although the case is one in which only the medical specialist is competent to pass sentence.

Like pruritus vulvæ and pruritus ani, with which latter it is often associated, this form is most harassing and rebellious to treatment. It may cause insomnia, dyspepsia, neurasthenia, cachexia, and even suicide. I have seen an example.

In spite of the repeated scratching, the skin reacts very slowly. When eczematization and lichenification have occurred, the diagnosis may be difficult. After a time it is not uncommon to see the afflicted parts become pigmented.

The causes of pruritus of the genital organs in man are the same as those of pruritus ani and the other local forms of pruritus.

Pruritus Narium.—This form of pruritus, sometimes very troublesome, is observed especially among those of a nervous or arthritic temperament. According to Brocq, it often precedes paroxysms of asthma; it may then be associated with a pruritus of the presternal region. Pruritus of the nares is frequently observed among subjects afflicted by intestinal parasites.

Pruritus of the tongue belongs to the number of multiple sensations complained of by certain subjects, and which has received the name of *glossodynia.* This rare affection should be classed among the *dermatoneuroses indicatrices.*

I have observed only eleven cases in my clinic at the Hospital St. Sauveur and in private practice. Among these eleven there were seven women. Among these seven the pruritus appeared five times at the beginning or in the course of a neurasthenia. Two of the women were also hysterical, in whom hysterical convulsions developed some months after the pruritus of the tongue. In these two cases the lingual pruritus preceded—in one by two years, and the other three years—the beginning of a general paralysis.

Of the four men affected by pruritus of the tongue, in two the affection occurred at the beginning of a neurasthenia, once preceded a general paralysis, and once it served as the dermatoneurotic indicator of a diabetes, which had existed unrecognized by several of my confrères. In six of these cases the pruritus attacked almost the entire surface of the tongue, particularly the dorsal aspect, and in three cases it was accompanied by nausea. In five cases the itching sensation was more localized. In two it attacked the left half of the tongue; in one case the right half, and in two the anterior portion.

Pruritus of the Palms and Soles.—In certain cases the pruritus is located in other portions of the integument. These local forms present an etiology similar to that which we have indicated in regard to pruritus in general. They are found especially among those of a nervous arthritic temperament. They are met with sometimes upon the palmar and plantar surfaces. In these cases the pruritus is symmetrical. This form of localization is rare, but it is very stubborn. In several instances I have seen palmar and plantar pruritus precede for several months or even several years, and act as a dermatoneurotic indicator of an affection described by E. Besnier under the name of symmetrical palmar aud plantar hyperkeratosis—a disease whose nervous origin is, according to my ideas, incontestable. In several instances the paroxysm of palmar and plantar pruritus was accompanied by intense hyperidrosis of the pruriginous regions.

Pruritus of the Ears.—In some cases, among others, one occurring

in the practice of my preceptor and friend, Dr. Tavernier, I have observed an intense symmetrical pruritus of both ears, involving the whole ear, preceding by from one to three days a violent attack of migraine. In one case the pruritus was followed after some hours by congestion of both ears.

Pruritus of the Scalp.—I have quite frequently noticed among nervous subjects, particularly among women who are neuropathic and hysterical, a pruritus more or less severe, located on the scalp. This pruritus, which develops independently of any eruption or appreciable change in the scalp, acquires sometimes an extreme intensity and persistence, and violently disturbs the sufferers, who rub and scratch the head continually, and have in consequence a more or less pronounced alopecia. In certain cases the alopecia consecutive to the pruritus has been so rapid in its occurrence and so pronounced that I have asked myself if it ought not to be considered as a true glandular dermatoneurosis, of which the pruritus was simply the dermatoneurotic indicator. In one case, a young woman of sixteen, this pruritus of the head preceded by a year and a half the appearance of a general paralysis, of which it was undoubtedly a forerunner.

Abolition of Cutaneous Sensibility—Anæsthesia.

Anæsthesia is characterized by a complete abolition or by a diminution of the sensibility of the skin.

It may abolish more or less completely tactile sensation (tactile anæsthesia), the sensation of temperature (thermo-anæsthesia of Axenfeld), and the sensibility to pain (analgesia of Beau). The individuality of the different forms of anæsthesia has, in fact, been well established by the study of the cases in which each of them appears isolated. It is not uncommon for tactile anæsthesia and analgesia to occur independent of each other, but it is less common to observe thermo-anæsthesia or a loss of muscular sense without the loss of tactile sensation or sensibility to pain being associated. The anæsthetic subject appreciates only in a confused manner the form and the quality of the surface of the objects which he sees and makes use of; the feet do not feel directly the ground on which he walks. If we place the finger upon the skin and then press in a gradual and firm manner, we can ascertain all the gradations and all the shades of contact, of pain, and of temperature in the anæsthesia; and following this, discover the weakness of the sensation of tickling, even to the complete abolition of sensibility.

The anæsthesia is rarely complete. It is more often partial,

distributing itself according to the lesion which causes it, affecting sometimes one-half of the body, sometimes the two lower limbs, or limited portions, frequently very limited portions, of the skin.

Analgesia, or insensibility to pain, is most frequently a condition isolated from all the special or distinct paralyses of the skin. The patients, who perceive with rare acuteness a contact of the lightest degree, the slightest stroke with a feather, for example, a rapid breath, or movement of the hairs, are absolutely insensible to pain. Pricking, pinching, twisting, or cutting of the skin does not cause them any suffering. When the sense of touch has been lost, it is rare that the sensibility to pain is not lost also; yet in some cases the contrary has been observed.

Thermo-anœsthesia, like analgesia, is rarely very persistent when anæsthesia, properly so called, is well marked. Yet Vulpian has seen a young hysterical woman in whom this cutaneous sensibility was absent, except the faculty of perceiving a very extreme degree of heat.

It is not very uncommon to find that one of the forms of sensation is weak or even abolished, while another is exalted. We have seen above that a painful hyperæsthesia is often associated with a tactile anæsthesia more or less well marked. Likewise some patients receive a very vivid impression of heat and cold in spots where they have lost the sense of contact or of pain.

Allied to these queer combinations of disorders of sensation is the symptom which has been designated under the name of *painful anæsthesia*. This is an apparently paradoxical phenomenon, dependent upon the fact that the patients often experience sharp pain on the surface of those portions of the body which are totally deprived of sensation. This variety of anæsthesia is observed frequently in zona, particularly facial zona, in leprosy, in syringomyelia, Morvan's disease, and the different cutaneous trophoneuroses.

A local anæsthesia, even when it is complete and absolute, is often unrecognized by the patients, especially when the anæsthetic territory is small. This is observed sometimes in leprosy, where the anæsthesia is often very pronounced and of considerable diagnostic value.

This anæsthesia is often so profound that I have seen the patients burn, bruise, and cut themselves seriously without experiencing the slightest pain.

General anæsthesia with absolute analgesia is rare; it manifests itself in hysteria; it sometimes accompanies serious diseases of the nervous system. All the authors mention a general anæsthesia during the final period of general paralysis, neither ulcerations nor extensive sloughs causing any painful sensations.

Marcé cites an example of a paralytic using sufficient traction upon the ends of his fingers to tear out, successively and with perfect indifference, the nails on all his fingers.

It is possible to conceive how anæsthesia can be caused by functional disorders, especially when they involve the upper and lower extremities. Moreover, this anæsthesia, particularly when the hands are involved, may in consequence of numerous traumatisms be the indirect cause of more or less serious changes in the skin, such as ulceration and sloughing.

On account of their loss of sensibility, it often happens that patients burn and cut themselves without knowing it. That is frequently the case among lepers. For this reason it is well to protect the anæsthetic parts when they are exposed to traumatism by means of occlusive dressings, which play the double rôle of defending them against external agents and of preventing inoculation of the erosions and ulcerations which may be produced upon the surface by pathogenic organisms and particularly by those of suppuration. Even when, on account of the nerve changes occurring at the same time as the anæsthesia, there are produced trophic disorders of the skin, the ulcerations and the sloughs are generally not so severe under these occlusive dressings as they are when the anæsthetic parts are not protected. In every such case inoculation with pathogenic organisms, and particularly with those of suppuration, is less likely to occur. Thus, we see that in the treatment of anæsthesia, the occlusive dressings play as important a part as they do in the treatment of pruritus.

It has been noticed that anæsthesia is usually not present in diseases of the skin which are not of nervous origin, even when they attack the integument deeply; but, on the other hand, it is the rule to find it, in a more or less pronounced degree, in all dermatoneuroses, even in those which affect the skin in a very superficial manner. The truth of this axiom can be confirmed by studying with care the sensibility of the skin in different diseases by means of the compass of Weber or of Brown-Séquard.

Anæsthesia is of great importance in the study of dermatology. When it exists, the nervous origin of the dermatoses in which it is present should be suspected. It is in these cases that it serves to clear up absolutely a doubtful diagnosis. Often the mere fact of its presence in achromic or hyperchromic spots, ulcers consecutive to the bullæ of pemphigus of the extremities, or on apparently healthy portions of the skin, such as the palpebral and facial regions, will justify the diagnosis of leprosy, which was up to that time doubtful.

I have seen well-informed physicians fail to recognize leprosy

from having neglected to give to anæsthesia of certain regions of the skin the value belonging to it. I have also several times recognized that certain ulcerations, difficult of diagnosis, were of trophoneurotic origin after a close study of the sensibility, and have thus been enabled to institute a rational method of treatment.

Anæsthesia may depend upon changes of the peripheral receptive organs. This is a chapter which is yet to be written. We really know almost nothing of the changes in the peripheral receptive organs, and consequently almost nothing of the symptoms by which these lesions, for the most part still hypothetical, manifest themselves. Changes in the peripheral nerves are frequently a cause of anæsthesia. It is limited to the portion controlled by the nerve which is involved. In a general way exceptional and but little marked in the painful neuralgias, it is, on the contrary, the rule in certain forms of neuritis of the small subcutaneous nerve filaments, ordinarily so inactive that their existence was unrecognized until 1879. Anæsthesia secondary to a change in one or several nerve trunks is located in one or several isolated portions of the skin corresponding to the anatomical distribution of the nerve or nerves, and is often preceded by symptoms of pain.

Lesions of the spinal cord and its membranes are frequently the cause of anæsthesia. As Ballet has correctly stated, if the disorders affect the two limbs, and still more if they affect all four—if they persist under the form of a paraplegia or a diplegia—they depend upon a transverse lesion of the cord, and in this case consist in anæsthesias combined or not with hyperæsthesia.

We have also to do with a cord lesion (locomotor ataxia, disseminated sclerosis) when the changes are distributed irregularly, are characterized by fulgurating or tearing pains of variable location, and by spots of hyperæsthesia or anæsthesia arranged without order on the skin. Likewise, when we find a hemianæsthesia of general sensibility with integrity of the special senses, combined with hyperæsthesia and motor paralysis on the side opposite to that of the hemianæsthesia, there will be a lesion of one-half of the cord resembling those produced experimentally by hemisection.

Anæsthesia may be observed in the course of lesions of the mesencephalon and also of lesions of the cerebral cortex. It is very frequent in the course of certain neuroses, particularly in the hysterical. We refer for the study of this to the works of Bicquet and especially those of Charcot. Hysterical subjects sometimes make use of the anæsthesia of their skin in order to produce upon its surface divers lesions. I have observed a number of dermatoses simulated by hysterical subjects, the lesions being located for the most part

upon the anæsthetic portions of the skin. This loss of sensibility enabled hysterical subjects, especially in the middle ages, to endure the most severe and persistent tortures, and pretended sorcerers in those days, who bore marks (stigmata diaboli) as signs of possession, had simply cutaneous areas absolutely anæsthetic.

Chronic poisoning by bisulphide of carbon, lead, mercury, alcohol, etc., frequently causes anæsthetic symptoms. There are also certain acute or chronic diseases, *e.g.*, diphtheria, variola, typhoid fever, cholera, yellow fever, malignant jaundice, and particularly leprosy and pellagra, which may produce it. The anæsthesias which occur in these conditions appear to be due to changes in the central or peripheral nervous system. Changes in the peripheral nervous system have been noted in the course of most of the intoxications of chemical or bacterial origin.

The Perversions of Sensibility.

Besides the two extreme varieties of disorders of sensibility which manifest themselves by exaltation or abolition, there are others which may be grouped, a trifle artificially, under the name of perversions, because it is difficult to place them in one or the other preceding categories.

Dysœsthesia.—This is, Charcot says, a sort of hyperæsthesia in which the slightest excitation gives birth to a very disagreeable sensation, which is always the same whatever may be the nature of the excitation, and in which, according to the statements of the patient, a feeling of vibration dominates. These vibrations seem to ascend from the root of the limb at the same time that they descend towards its extremity. In the majority of cases these sensations persist for several minutes, some for a quarter of an hour or more after the cessation of the cause which produced them. In such case the patient always has great difficulty in designating exactly the place where the excitation was produced.

Allochiria (confusion of side), described by H. Obersteiner, is very similar to dysæsthesia, and consists in this fact that the patient refers to one of the limbs the impression produced upon the opposite side.

Error of place consists in the impossibility of locating the exact spot where an impression is made.

Delayed sensation, first noted by Cruveilhier, consists in the fact that the patient is not conscious of the sensation for several seconds after the stimulus has been applied. It is associated sometimes with a prolongation of the duration of the sensation, which may persist for a long time after the contact has ceased.

MOTOR DERMATONEUROSES.

These are cutaneous diseases of nervous origin characterized by one phenomena alone, viz., the contraction of the muscular fibres of the skin and particularly of the glandular muscular fibres of the hair and sebaceous follicles.

Cutis Anserina.

Under the name of goose flesh is designated the well-known phenomenon of the erection of the hair follicles under the form of small miliary projections, hard, conical, and usually presenting in their centre a hair or a pilosebaceous follicle. The erection of the hair follicles under the influence of the contraction of their muscular fibres is a common and transitory phenomenon. This contraction, due to a nervous excitation of the muscular fibres, is analogous to the phenomena which take place in certain animals. It is well known that in a large number of mammifera (monkeys, dogs, wolves, bears, or cats) a nervous impression (fear, anger, etc.) may produce the erection of the hairs by the contraction of the muscular fibres of the follicles.

Goose skin involves the whole or the greater part of the follicles of the skin. It is observed principally on the trunk and the extensor side of the limbs. But it may involve nearly the whole of the cutaneous surface except the palms and soles and the ears. It is very rare on the face. Yet it has been observed several times among impressionable men or women in consequence of sudden and violent mental emotions. In these cases the skin presents a grained appearance, particularly recalling that of a coarse skinned orange, and associated with very marked pallor. This condition lasts some seconds or some minutes. One of these sufferers, a distinguished Parisian physician, was affected every summer with dysidrosis of the face and neck. This coincidence deserves to be noted. In another subject, a very nervous and impressionable young woman, this phenomenon of cutis anserina of the face was frequently accompanied or followed immediately by a very profuse hyperidrosis.

Cutis anserina is due to a nervous excitation of the muscular fibres of the skin. This nervous irritation may result in an impression carrying its action at once to the periphery.

In this category belongs especially the goose flesh produced by a sudden variation of temperature, such as cold air, a cold bath, cold douches, or too hot baths.

Certain irritations of the skin, particularly tickling, may cause the phenomenon.

Among some dermographic subjects these phenomena may be very well marked. Barthélemy in his "Étude sur le Dermographisme" relates a case in which a touch with a blunt point suddenly produced in all of the corresponding half of the trunk from the shoulder blade to the coccyx, but limited sharply in the median line by the vertebral column, a unilateral erection of all the pilosebaceous follicles in such a way as to cause a vast zone of goose flesh strictly hemilateral and so pronounced that it gave to the skin a honeycomb appearance. This condition persisted for ten minutes, then disappeared gradually. There was a vivid contrast to the normal skin, which remained perfectly natural on the opposite side.

It is not uncommon to see pruritus cause this phenomenon, especially on the surface of and around the pruriginous regions. This symptom may have a certain diagnostic importance in cutaneous pathology, for it is in these cases an index of considerable excitability of the nervous system, and may permit us sometimes to suspect the dermatoneurosal nature of the eruption.

Some months ago I was called in consultation by Dr. Quint, of Lille, to see a patient who had been suffering for several months from a very remarkable dermatoneurosis.

A man, very vigorous, 35 years of age, non-alcoholic and perfectly well otherwise, but nervous and of neuropathic descent, was suffering from marked neurasthenic phenomena as a result of violent and prolonged grief, mental exhaustion, and annoyances of various kinds. These neurasthenic symptoms were characterized by an external impressionability of the nervous system (the patient could not hear music or see a funeral pass without bursting into tears, and he started at the least noise), by insomnia, by dyspepsia with dilatation of the stomach, and by a mild vertigo. Some time after, the patient experienced all over the cutaneous surface a sensation of prickling and intolerable pruritus, and there appeared a permanent and general erection of all the pilosebaceous follicles, accompanied by a sort of hyperæmic condition of the whole skin and by wheals of urticaria.

When I examined the patient for the first time I found a subject vigorous in appearance, but whose aspect, sad and sombre, struck me at once. The entire cutaneous surface, including the conjunctivo-palpebral margin of the eyelids, was the seat of a pronounced and permanent hyperæmia resembling that of sunburn, and all the pilosebaceous follicles except those of the head were in a state of permanent erection. This goose skin was always present, yet increased when the pruritus increased, or when the patient rubbed himself or felt strong mental emotions. I have seen this condition of the skin pass over a large portion of the surface of the body in successive waves under the influence of the exciting causes above mentioned.

From time to time urticarial wheals appeared, but when I examined him there was no evidence of dermographism. In addition to the hyperæmia of which I have spoken, there existed a kind of œdematous thickening of the skin upon the neck and limbs, extending over a considerable surface and appearing and disappearing rapidly. The patient felt continually over the whole surface of the body an atrocious itching which forbade all rest and kept him in a continual state of irritation.

In certain cases cutis anserina may be produced by violent and simultaneous contraction of the muscular groups of a special region, as in deep and rapid inspiration.

It often appears in consequence of excitation of the central nervous system, especially the brain, lively mental emotions, fright, the sight or reading of moving or terrifying scenes; patriotic exaltation, for example, that which is experienced by the passing of a regiment preceded by music; the hearing of a discourse or impressive music; the sight of a terrible fire, a sudden catastrophe, the sound of thunder, etc.

The swallowing and even the thought only of having swallowed certain disagreeable liquids, certain medicines, may excite the phenomenon. In these different cases it is accompanied often by a sense of shivering. Finally, the affection is frequently present in the course of a chill.

Not only are contractions of the muscular fibres of the hair follicles produced by the causes which we have indicated, but contractions of the muscular fibres of certain regions of the skin, particularly the scrotum, may also be excited. I have observed among certain subjects—among others those affected by cutis anserina of the face, of which I have spoken above—a special contraction of the skin of the face, recalling that occurring in the scrotum.

VASCULAR DERMATONEUROSES.

As I have stated in the beginning of this article, it is difficult to define absolutely the limits of the vascular dermatoneuroses or the purely vasomotor trophic neuroses of the skin. If there are really any main types around which can be grouped the purely vascular neuroses of the skin, such as blushing, and the purely trophic dermatoneuroses, such as vitiligo, yet in the vast majority of cases the vasomotor neurosis of the skin does not exist absolutely pure and is not diagnosed by the symptoms depending solely upon vascular dilatation. It is caused by diapedesis, by changes in the vessels, by thrombi, by lesions of the vascular endothelium, by modifications of the cellular or connective tissue— in a word, by lesions not simply or purely con-

gestive, but depending upon the vitality of the anatomical elements and the trophic changes.

As Vulpian has said:" "The vasomotor nerves play but a secondary rôle in the pathogenesis of disease. It is the anatomical elements of the tissues which are primarily affected, and the vasomotor nerves act only secondarily in the production of the local anæmias and more often the local congestions."

So we see here, again, as I taught in 1884 in my clinics at the Hospital St. Sauveur, that the vasomotor dermatoneuroses pass insensibly into the neuroses of the skin determined by trophic cellular lesions of the tissues, even as congestion leads to inflammation.

What makes this question still more complex is the fact that in a certain number of cases the vascular dilatation or the opposite condidition of ischæmia and the modifications of the vitality of the tissues which exist in consequence strongly favor the destructive action of the pathogenic microbes of exogenous or endogenous origin or of the toxins which may be contained in the system. Besides, it is generally difficult to distinguish the dermatoneuroses of vasoconstrictor from those of vasodilator origin, for the transition of vascular constriction into vascular paralysis is almost a physiological rule.

We may further remark that a close relation exists between passive hyperæmias and anæmias of the skin. As Unna says:" "Both are the natural result of abnormal resistance in the capillary network, only the quantity of blood varies in the two cases; this is why we often see an almost insensible transition of one into the other."

So the vascular dermatoneuroses border on passive hyperæmia, and cyanosis presents a close relation to the vascular neuroses of the skin, ischæmic or anæmic. Raynaud's disease constitutes a remarkable example.

The vascular dermatoneuroses may be classified in the following manner, prefacing the statement that in many of the groups vasoconstriction and vasodilatation are often mingled.

1. Hyperæmic, congestive, or vasodilator dermatoneuroses.
2. Anæmic, ischæmic, or vasoconstrictor dermatoneuroses.
3. Raynaud's disease (local syncope and asphyxia of the extremities). This disease, which includes the symptoms both of cutaneous hyperæmia and of anæmia in its advanced stages, presents, besides, some relationship to the trophic neuroses of the skin.
4. Urticaria, or hyperæmo-œdemato-ischæmic dermatoneurosis.
5. Œdematous dermatoneuroses.
6. Hemorrhagic dermatoneuroses.

In the preceding classification we have included those neuroses of the skin whose principal physiological and clinical phenomena are de-

termined by disorders of vascular innervation, without there resulting, properly speaking, any marked change in the vitality of the tissues—in a word, any trophic changes.

Yet to avoid repetition, and in order not to multiply uselessly the dermatoneuroses from a clinical point of view, I have studied with the vascular neuroses of the skin certain diseases which, although terminating as pronounced trophic lesions of the tissues, nevertheless present as their principal characteristic ischæmia or hyperæmia; such are Raynaud's disease, certain erythemata, etc.

We shall also see, when studying the trophic neuroses of the skin that I place in this class, cutaneous lesions which may be accompanied by phenomena of vascular origin (ischæmia, hyperæmia, hemorrhage, etc.), but whose principal characteristic is, nevertheless, trophic change in the tissues; such are certain forms of herpes, eczemata, and trophic lesions of the extremities (Morvan's disease), certain ulcers, gangrene, etc. I thus avoid creating a mixed class of neuroses of the skin, that is to say, dermatoneuroses which are at the same time vasomotor and trophic—a class which it is well enough to distinguish theoretically, but the recognition of which would appear to have no practical utility. We do not form groups of intermediate or transitional types, but rather of clinical and physiological forms around which are grouped diseases less distinctly marked, yet not the less belonging by their principal characters to the types which form the basis of this classification. Such is the case with the mixed dermatoneuroses, some of which will be considered under the vasomotor neuroses of the skin and the others with the trophic neuroses, according to the predominance of one or the other symptom. These are, I repeat, transition types. They cannot constitute a class. They simply show that there exists a series of intermediate degrees between the purely vasomotor and the purely trophic dermatoneuroses.

Hyperæmic, Congestive, or Vasodilator Dermatoneuroses.

In a general way if we adopted the opinion of certain authors the study of the hyperæmic or congestive neuroses of the skin would include that of almost all the cutaneous hyperæmias whatever their etiology.

In 1883 I put myself on record in opposition to this manner of looking at these disorders, in my critical analysis of Schwimmer's work upon the neuropathic dermatoses." I held that it was dangerous to include hastily, without sufficient proof, among the dermatoneuroses, under the name of angioneuroses, diseases whose nervous

origin had not been demonstrated in a positive manner. In a question so difficult, before seeking to construct a class under the name angioneuroses, we must be sure that the diseases which are taken to constitute this class can be considered without any shadow of doubt as depending upon a functional disturbance of the nervous system. What my teacher, Vulpian, wrote in the admirable preface to his lectures on the vasomoter apparatus must always be borne in mind: "I have always," says Vulpian, "contended against that deplorable tendency to apply prematurely to pathology the yet uncertain data of experimental physiology. Most of the assertions which are thus put forth, without any special critical observation, are absolutely devoid of proof. They are the conceptions of the laboratory as each one is pleased to imagine them. And it might easily be proved that the vasomotor actions attributed to such and such a drug or such and such a poison, by physicians who have never made any experiments whatever, are often the contrary of that which physiology reveals to us.

"As to the attempts at explanation of morbid conditions by the functional disorders of the vasomotor apparatus, they are not usually more acceptable than those which concern the action of toxic or medicinal substances. In the vast majority of cases the vasomotor nerves do not play in the pathogeny of disease anything but a secondary rôle. It is the anatomical elements of the tissues which are primarily involved, and the vasomotor nerves come in a little later to cause the anæmia or more often the congestion. The congestion, to speak only of that, is always or almost always a secondary phenomenon and without real importance except in those cases where it is produced to meet the needs of increased nutritive action or exaggerated secretion." Thus, faithful to the principles and the scientific methods upon which I have stood since 1878, I have not thought that polymorphous erythema and erythema nodosum ought to be placed among the vascular dermatoneuroses. Besides, in the actual state of our knowledge, we really do not possess any positive evidence that will permit us to affirm that these affections depend upon a disorder of function of the nervous system."

It has been known for a long time that these erythemata are not merely local phenomena, but are often accompanied by fever and other general symptoms, by rheumatoid pains, etc.

There is, on the other hand, more and more of a tendency to believe that in erythema multiforme, erythema nodosum, and the erythemata which occur in the course of the infectious diseases (diphtheria, cholera, typhoid and typhus fever, influenza, variola, pyæmia, septicæmia, etc.) the local symptom is dependent upon the toxic action of some morbific agents in the blood upon the vessels of the skin.

If, then, in these erythemata the nervous system plays a certain rôle, this rôle remains entirely in the background, and is in every case almost completely effaced by the predominating pathogenic action of the bacteria and the toxins in the blood.

What I have just said in regard to erythemata occurring in the course of the general infectious diseases seems applicable equally to the erythemata occurring in consequence of auto-intoxication, or of the ingestion of toxic substances or drugs (spoiled canned foods, stale fish, high game, etc.; copaiba, chloral, sulphonal, quinine, antipyrin, antitoxin injections, etc.). Here, again, it is evidently the pathogenic action of the toxic products in the blood which is primary, the positive action of the vasomotor nervous system being secondary.

There are, however, some cases in which there is a peculiar susceptibility of the vasomotor nervous system, and then the toxic or other substances in the blood play a subordinate part. I will explain myself. The ingestion of a moderate amount of alcohol, of strawberries, of shellfish, or of game of good quality does not cause any reaction in the case of the vast majority of people; in certain individuals, on the other hand, a minimum quantity of these substances will produce an attack of erythema or urticaria, sometimes very marked.

I knew a talented painter who could not drink a certain quantity of wine without having at the end of the repast his face, neck, backs of the hands, wrists, and forearms covered with a confluent eruption of papulous erythema, with large rounded lesions, a goodly number of them, however, being marginal. This erythema persisted for from two to four hours. I have seen the phenomenon produced in this subject a number of times. I may add that none of the other people present at the dinner, although they paid the wine served as much honor as did the painter himself, presented the least sign of an erythema. Again, I knew a lady who could not eat the slightest quantity of raspberries, even covered with cream or sugar, without having her neck and the upper part of her chest disfigured with a macular erythema, a large part of which remained for from five to six hours. Therefore she was obliged to abstain absolutely from raspberries or their products, such as raspberry syrup, whenever she wore a décolleté gown.

I could cite other analogous facts, and there is hardly a drug in regard to which the same observations have not been made. The association of similar facts makes it impossible not to admit that these subjects possess a vasomotor nervous system which is particularly impressionable. Moreover, these subjects are often of a nervous and especially of an arthritic nervous temperament.

The preceding facts, to which might be added others, prove that it is necessary to take into consideration (in a greater or less degree) the individual susceptibility of the vasomotor system in the eruptions of alimentary, toxic, or medicinal origin.

It is probable that the same is true in regard to the eruptions of the infectious diseases. But we do not possess sufficient evidence upon this point. We may recall the views which Vulpian advanced in 1875 in regard to cutaneous hyperæmias in the eruptive fevers:

"In these cases of eruptive fever, it is necessary to distinguish the general congestion which the skin presents during the period of invasion from the more or less circumscribed redness which appears at the time of the eruption and which constitutes the exanthem (rubeola or scarlatina) or the first stage of the exanthem (variola). The general redness of the period of invasion of the eruptive pyrexias, such as is observed during the course of a typhoid fever or throughout the duration of all diseases accompanied by fever (phlegmasias, etc.), is produced very evidently by the same mechanism as is the cutaneous congestion of the hot stage of the miasmatic fevers. There is without doubt a weakness of the vasomotor centres by which the vasoconstrictors of the skin are controlled, and the difficulties which we have encountered in seeking to unravel the cause of this weakness are found here in equal measure. We can further remark in regard to the fevers of which we were just speaking that the functional weakness of these vasomotor centres favors the inhibitive action which cutaneous irritations can exercise upon the activity of these ganglia; and thus, as we know, these irritations cause marked local congestions more promptly and easily than in the normal state. The light rubbing of the skin with a blunt object causes at the end of some minutes a red mark. Yet it must not be thought that all vasoconstrictor reaction is impossible; for even in typhoid fever, where these congestive marks (*taches méningitiques*) appear with so great facility, we may obtain the pale tracings of reflex vascular constriction by submitting the skin to very weak excitations, such as a short superficial rubbing with the pulp of the finger.

"The redness of the skin which constitutes the exanthem or which shows itself at its onset is very probably due to a mechanism a little different from that of the general congestion observed during the period of invasion. In the first place it is incomparably more vivid, and then it appears under the form of macules or of circumscribed spots with or without elevation of the skin. These circumscribed congestions appear to be due to an irritation of the integument by a morbific agent which differs in each of the exanthemata, but which offers this common characteristic, viz., that of acting upon the super-

ficial elements of the skin as if it tried to eliminate itself by this channel. The irritation produced upon the superficial portion of the skin and the cells of the Malpighian layer provokes a dilatation of the subepidermic vessels. This dilatation takes place over an area of varying extent, and gives to the cutaneous congestions various forms according as they are more or less circumscribed in one or another part of the skin."

Moreover, in order to show how the pathogeny of the erythemata is shrouded in obscurity and how contradictory upon this subject the opinions of authors are, I need only refer the reader to the very remarkable essay upon the pathogeny of the erythemata written by Besnier and Doyon as a supplement to the French translation of Kaposi's work on "Diseases of the Skin" (2d edition, p. 333).

We will now take up the study of the cutaneous hyperæmias of indisputably nervous origin, particularly of those possessing a special interest for the dermatologist.

The hyperæmias of the skin due to functional disorders of the vasomotor system may result from changes in the nerves or peripheral ganglia, such as are observed in consequence of divers lesions of the great cervical sympathetic. In these cases a congestion is produced of half of the face and the corresponding side of the head. Congestions of the same kind may be noted in the different parts of the body in consequence of sections, compressions, and divers lesions of the vasomotor nerves, of which Weir Mitchell, Morehouse, Keen, some English authors, Eulenburg, and Guttman, have given examples. Lesions of the spinal cord may also cause congestions due to changes in the vasomotor system. These are facts which experimental pathology has abundantly demonstrated. Clinically, we frequently notice vascular changes in the paralyzed and contractured limbs following a traumatic lesion of the spinal cord. Sometimes these limbs are pale, anæmic, cyanosed, and cold; at others they are redder than in the normal condition. This change of color is especially marked on the surface of the hands or feet, and "it may be seen," says Vulpian, "that the superficial vessels are generally in the first case constricted and inconspicuous, and that in the second on the contrary, they are full of blood and dilated."

I have had under observation for a number of years a neurasthenic, nervous arthritic subject who, after a period of prolonged grief due to a reverse of fortune, suddenly experienced upon his face, trunk, and limbs a sensation of glowing heat accompanied by vague sensations of formication. Soon after he was astonished to discover that his skin, ordinarily very pale, had taken on a red, congestive tint upon the face, neck, and limbs. This congestive color became more

and more pronounced; it involved the whole cutaneous surface, but the redness was always deeper upon the face, neck, and limbs, where it was the color of a boiled lobster, although upon the rest of the body it did not exceed a rose tint. Some years after, this congestion was accompanied by a sort of very fine varicose dilatations of the vessels of the head, neck, and extremities. The sensation of heat in the skin was always very ardent, and the nervous state of the patient did not improve. There was also a constant sense of oppression, doubtless due to a pulmonary congestion more or less pronounced. It is difficult not to attribute this strange congestion of the skin to changes in the vasomotor system. Unfortunately, I was not able to follow the evolution of this affection to its end, as the patient suddenly disappeared after I had kept him under observation for two or three years.

Lately, several cases have been reported of hyperæmia characterized by a turgescence and a quite pronounced redness of the extremities, which has been called *erythromelalgia*, and which must be compared to local affections of the extremities characterized by anæmia and spasm of the vessels. In fact, as the observations of Weir Mitchell" have clearly demonstrated, there exists a vasomotor paralysis of the vessels of the extremities, or erythromelalgia, which ought to take its place in nosology beside the local asphyxia and symmetrical gangrene of the extremities described by Maurice Raynaud. This disease is observed especially among men. It is characterized by a diffuse redness affecting, as a rule, symmetrically the upper and lower limbs, involving sometimes the face and ears, and occurring in the form of paroxysms accompanied by tumefaction, marked elevation of temperature, and sometimes by local sweating (the painful sweating foot of Benedikt), and always by severe pain. The pain increases at times as do the other symptoms which accompany it, and these painful paroxysms are often atrocious. The disease as a whole has a long duration and a much more rapid evolution than Raynaud's disease, from which it is distinguished also by the vivid rose or red tint of the skin and the absence of trophic disorders. The progress of the disease is slow, with periods of remission and exacerbation of the symptoms following the seasons—the winter diminishing the troubles and the summer increasing them in a marked degree. There is also impairment of digestion. The nature of the disease seems to place it in relation either with the functional disorders of the motor nerve centres of the cord or more probably with those changes still undetermined, which take place among the numerous peripheral ganglia existing near the terminations of the nerves in the vessels.

The changes in the different portions of the encephalon can also cause cutaneous hyperæmia.

The investigations of Routier, Axenfeld, Dunglison, and especially those of Brown-Séquard, Vulpian and Charcot, and Gubler," have shown that it is not uncommon to observe cutaneous hyperæmia and elevation of temperature in the limbs of the side affected by hemiplegia. Both Vulpian and Gubler have pointed out that the *tache méningitique* is easily produced in the upper limb of the paralyzed side.

It is necessary to note also that a mechanical or faradic stimulus causes goose flesh more rapidly, and in a more lasting and pronounced way, in the paralyzed regions than in the sound ones. We shall see presently that the circulatory changes produced by lesions by the encephalon and of the cord may be revealed by ecchymoses, of cutaneous hemorrhages, and by sugillations.

The various emotions (such as anger, joy, fear, bashfulness, shame, etc.) are a frequent cause of congestion of the skin. In these emotional congestions a redness, more or less vivid, involves the face with a varying rapidity, and may extend to the ears and forehead. The blush may, especially in nervous subjects, and in women particularly, extend even to the upper and anterior portion of the chest.

"This blush," says Vulpian, "may extend downwards to the mammary region and even to the base of the sternum, and upwards above the clavicles and the sternum to the middle of the neck; it may be noticed at the same time on the upper part of the back, over the scapular regions, whence it may pass up over the shoulders even to the clavicles. I have determined in a number of cases that there is no necessary relation between the extent and intensity of this congestion and the degree of that which appears on the face; it is not exceedingly uncommon to find that emotional blushing may be very pronounced upon the upper portions of the trunk among women who show almost no congestion of the skin of the face. These emotional congestions of the trunk prove clearly that the inhibitory influence exercised upon the vasomotor apparatus by disturbances of the emotional centre may reach the centres of vascular tone situated below those which innervate the vessels of the face.

"The distribution of this emotional redness of the trunk presents some points of interest. It is not diffuse in the beginning as in the face. We see produced upon the upper portion of the thorax, the sternal region, and below the clavicles, rosy spots irregularly rounded, sometimes irregularly annular, from a few millimetres to a centimetre or less in diameter, at first isolated, then rapidly confluent and tending soon to unite by their borders in a way to form more or less extensive patches. These spots may likewise unite by their borders, and the whole skin of the upper and anterior portion of the thorax may

then present a uniform and more or less intense redness. The appearance or development of this congestion takes place in the same way in the dorsal region when it manifests itself there.

"This emotional redness quickly diminishes in intensity, then gradually disappears, and the skin in the primary congestive points returns after a few minutes to its original color. It is this feature which rapidly clears up the diagnosis. At the time when the congestion takes on the form of roseola, one might believe in the existence of a syphilitic roseola, although the color of the skin is not the same in the two cases. But the error will not be of long duration, since the prompt disappearance of the emotional roseola, or even its transformation into a diffuse redness, immediately removes all doubt.

"The emotional congestions may be observed over a still more extensive surface. I have seen an emotional roseola in a man fifty years of age, very nervous, and suffering from neuralgic pains of variable location, when he was examined for the first time. This roseola involved not only the upper and anterior portions of the thorax, but also the shoulders, the anterior portion of the abdomen, and even the upper half of the thighs. It disappeared at the end of a few minutes and did not reappear on the following days.

"The roseolous form which the emotional congestions take at the beginning of their appearance is interesting. We may repeat in regard to this disposition what we said just now of the configuration of the eruption of measles, that the form of the eruption seems to indicate the existence in the skin of small vascular provinces or territories, more or less independent of each other and each under the control of distinct vasomotor nerves, or perhaps that of small peripheral vasomotor ganglionic centres. This view would naturally also account for the configuration of the various other erythemata, of the peculiar forms of the rheumatoid exanthemata, of syphilitic roseola, of febrile herpes, of herpes zoster, of certain artificial eruptions and even, going to the extreme limit, of the different varieties of the chronic cutaneous diseases, such as psoriasis.

"These emotional congestions present sometimes an asymmetrical disposition. Thus in a woman suffering from locomotor ataxia with an arthritis sicca of the right shoulder (having begun a long time before the primary symptoms of the cord affection) and in whom the symptoms of tabes dorsalis were much more marked upon the right side than the left, I have seen and shown to the persons who were assisting me at the time of the visit, an emotional roseolar eruption appear almost exclusively upon the right half of the anterior and upper portion of the chest. This eruption passed a little beyond the median line of the sternum, and extended upwards to a point just be-

neath the shoulder, reaching almost to the level of the spine of the right scapula." [30]

The emotional hyperæmias or roseolas do not always appear in relation with a mental emotion. Sometimes among certain subjects the sudden appearance of an emotional roseola of the trunk may be noticed, when the body is quickly uncovered. It is certain that in these cases the sudden contact with the air and the uncovering of the skin play an important rôle, for I have observed the phenomenon several times among prostitutes accustomed to undress themselves before any one, no matter when or where, and in whom the sense of shame had certainly long been lost.

This roseola is found usually on the upper part of the chest and back, and especially in a triangular space whose point, directed downwards, commences about the inferior third of the sternum and spreads out towards the shoulders, and on the back the point is likewise directed downwards, commences a little below the angles of the scapulæ, and spreads towards the shoulders. But in other cases I have noticed it located upon the abdomen, upon the lateral walls of the thorax, and the upper portion of the thighs, where it might easily be mistaken for a syphilitic roseola, and all the more readily since the emotional roseola was made up of round isolated spots not surpassing in size those of syphilitic roseola. As this emotional roseola is always apruriginous, I have several times seen a mistake in diagnosis. But the diagnosis is easy if care is taken to notice the evolution of the eruption. At the end of a minute or two, rarely ten minutes, and very rarely some hours, the emotional roseola disappears entirely. Syphilitic roseola does not act in this way. At the same time that these emotional hyperæmias appear, the subject feels a disagreeable sensation of heat, and sometimes a pulsation in the vessels in the congested portions, tinnitus aurium, and occasionally even disorders of vision, vertigo, and mental confusion.

It must be noted that emotional erythema, and even dermographism does not repeat itself indefinitely upon the same places at frequent intervals.

Emotional erythema is also met with in men and upon the portions which, ordinarily covered, are suddenly or for a long time exposed to the air, wind, cold, or light. This erythema may be observed not only upon the breast, but even upon the back, the forehead, and the bald scalp.

Barthélemy [31] has urgently insisted upon the relationship between emotional erythema and dermographism. We may note in conclusion that this vasomotor paralysis, secondary to changes in the nerves, the cord, the brain, etc., constitutes a predisposing cause of the dis-

orders of circulation and of nutrition, that appear under the influence of occasional causes which would have no effect in a normal condition; such disorders are blood stasis, œdema, inflammation, and gangrene.

Neuralgia sometimes gives place to more or less pronounced and extensive hyperæmia, which is evidently the result of a vasomotor nervous action. It is especially in connection with neuralgia of the trigeminus that hyperæmias of this kind may be observed.

As Vulpian has correctly remarked, "this phenomenon may manifest itself whatever may be the cause of the neuralgia." The hyperæmias produced by the neuralgias are often connected, though not necessarily, with the intensity of the pain. Cutaneous hyperæmias may even be produced under the influence of irritations of the sensitive nerves without there having been any pain, as Vulpian has observed in regard to the ataxias. Hyperæmia of the skin often appears in consequence of peripheral irritations and seems at first sight to be a reflex vasomotor hyperæmia. But it must be remarked with Vulpian that in these cases it is necessary to attribute an important influence to the nerve cells, isolated or collected in the small ganglia which are found in the neighborhood of the vascular walls or in the substance even of these walls. These ganglia, with which the vasomotor nerves of the different regions of the body are in relation, may play a considerable part in the phenomena of supposed reflex hyperæmia.

When a stimulus is applied to the skin the redness will not be slow in appearing at the point irritated, and even over a quite extensive area around the irritated point.

The vascular dilatations appear under the influence of all the mechanical irritations. As Marey, Vulpian, and Petrowsky have shown, when a longitudinal line is traced by means of a blunt point in one direction or the other, upon the cheek of a person who has a little color, the blood is momentarily driven out of all the vessels which are submitted to the pressure of the instrument, and a white exsanguinated streak remains. This purely mechanical anæmia disappears almost immediately, and the part becomes colored as before. After some moments (during which the subject of the experiment feels a sensation of very light constriction at the seat of the irritated points) the vessels contract anew at these points, and a more or less broad white line appears. This white tracing persists sometimes for several minutes, then the normal tint of the skin reappears slowly. It may become even more red than its normal condition, and so remain for some time.

These effects may be observed anywhere on the healthy skin, provided the irritation is not too energetic. Thus, for example, the

phenomenon may be observed upon the back of the hand or the surface of the forearm, the thigh, etc.

But these phenomena are not the same when the irritation is more energetic. If a line is traced rapidly upon the skin of the dorsal region of the hand or the forearm with a blunt point pressing down somewhat, nothing appears at first, but almost immediately upon the withdrawal of the irritation one has an impression as of constriction stronger than when the irritation is less energetic. After a very short time the line traced becomes reddened and this red color increases more and more. At the same time there appears on each side of the red line a pale whitish tracing much wider than the red line. These phenomena last a certain time, often more than a minute, then the white tracing gradually acquires the normal color of the skin. The red line which appears at the points traversed by the irritating object retains its color longer, even for more than an hour if the irritation has been very strong.

Whether there is a slight depression of the anæmic portions or a congestive tumefaction of the red line or a union of these two conditions, it always happens in the experiment in question that the red line is slightly elevated.

"The explanation of these phenomena is not very easy. Yet in all probability the stimulus acts principally upon the arterioles of the irritated region. The vessels are most richly supplied with muscular fibres, as we have seen, and they are able to contract sufficiently to prevent the passage of the blood globules. The blood contained in the arterioles is thus pushed into the capillaries and out of the capillaries into the veins, which probably contract also to a certain extent. The same is true of the capillaries. Although they are not contractile and cannot become narrowed by the same mechanism which produces the constriction of the arterioles and venules, the diameter of these vessels must nevertheless decrease because all internal pressure ceases when the arterioles are no longer permeable. In addition they are compressed by the elasticity of the tissues which they pass through. Doubtless in this manner the pale tracing is produced in the portion of the skin whose surface has been traversed by the mechanical irritant. It is a reverse effect, viz., a relaxation of the contractile walls of the vessels, which causes the appearance of a red line in the case of a stronger irritation. But is it in both of these cases a direct action of the irritant upon the vessels, or is it a reflex neurovascular action? It seems to us probable that it is largely a reflex vasomotor action, but added to it are the results of direct action upon the vessels.

"If experiments similar to those which have been here outlined are tried upon a subject suffering from a disease which causes con-

siderable depression of the cerebrospinal nervous system, the phenomena aroused by the mechanical irritation of the skin differ somewhat from those we have described. In these cases the rapid passage of a blunt point or of the nail over the skin causes the very prompt appearance of a red line, and the pale tracings which border this streak are less marked or even entirely absent. The red streak is produced with great clearness upon all portions of the trunk and limbs, but especially upon the abdominal region. It has been considered by some pathologists as having a certain diagnostic value, and they have designated it the *raie méningitique*. It is known at the present day, however, that this red line appears with great clearness and equal promptness in various other morbid conditions—in certain cases of typhoid fever, for example, as well as in meningitis; consequently, it is not possible to draw from this symptom any positive conclusion concerning the nature of the disease. At the beginning of typhoid fever or during convalescence these streaks of local congestion are more easily provoked upon the abdomen; but when the irritation is slight it may not cause the production of the pale lines, which are difficult to obtain even in the course of the disease. Bäumler has studied the various peculiarities of the production of the pale streaks under the influence of mechanical irritation, particularly in the early period of typhus fever, and the facility with which at that time these white streaks are produced leads one to think that the irritability of the arteries may be very much increased or diminished in certain morbid conditions. It will be therefore interesting to study minutely the varying influence of mechanical irritants upon the cutaneous vessels in these diseases, and particularly of those which more or less affect the nervous system; for these variations are certainly allied to the functional modifications of vasomotor innervation; and these modifications concern a number of morbid changes, the knowledge of which ought not to be valueless. But in order that we may draw from this study conclusions of some value, a large number of observations would be necessary. I have examined, in different cases of diseases of the spinal cord, the effect of mechanical irritation made upon the skin of the limbs with the pulp of the finger, with the nail, or a pointed or somewhat blunt instrument. In cases of compression paraplegia, the appearance of the white lines is more easily produced than is that of the red ones. In the case of a man suffering from gluteal and sciatic neuralgia, dependent probably upon lesions of the cord and its membranes, I have seen the red lines produced upon the thighs with a rapidity which was extraordinary, even when the irritation was very slight. These lines were bordered on each side by a broad anæmic band of irregularly limited contour, which disap-

peared very rapidly when the finger or instrument was applied with some pressure. In order to obtain the contraction of the vessels of the skin and to produce in consequence a pale tracing upon the surface of the spot directly irritated, the irritation must be reduced to a minimum of intensity. This may be accomplished, for example, by rubbing the skin very softly with the pulp of the finger. In a case of progressive atrophy of the muscles of the left shoulder in an adult, the irritation of the skin of the deltoid region by means of the nail produced the line more rapidly upon the left side than upon the right.

"In several patients afflicted with hemiplegia in consequence of hemorrhage or softening of the brain, mechanical irritation also produced the red streaks more easily upon the forearm of the paralyzed side than on the opposite side. These lines often were broader and lasted longer upon the paralyzed limb.

"I have compared the effect of mechanical irritations upon the two arms of a woman affected with hemianæsthesia caused by hysteria. The skin was evidently less colored and more pale upon the dorsal and palmar surface of the left hand (the anæsthetic side) than upon the corresponding parts of the right side. The red lines following tracings with a blunt point could be less easily produced on the arm affected by anæsthesia than on the other.

"In observations upon cases of diseases of the nervous system, subjects are found in whom the cutaneous vessels of certain parts of the body present an especial resistance to mechanical irritation. This has been noticed in cases of cyanosis of the face, feet, and hands, especially when the condition of the circulation has existed for a long time. Petrowsky was not able to cause the formation of the white lines on the skin of the face and hands of those who, on account of prolonged exposure to intense cold, presented a permanent redness of these parts. I have not succeeded any better in producing these lines by mechanically irritating the skin of the hands of patients suffering with disorders of the peripheral circulation." [25]

This reflex redness may manifest itself under the influence of irritations of other kinds made upon the skin. Thus a more or less intense congestion of the parts involved appears when the skin is subjected to a somewhat violent stimulus, such as percussion, pinching, etc. The same is true when the skin suffers from injury by a pointed or sharp instrument, in which cases the edges of the scratch are for a certain time the seat of a more or less lively congestion.

These results are manifested moreover under the influence of other excitants, such as chemical irritants, caustics, rubefacient and vesicant substances, preparations of cantharides or of mezereum, croton

oil, mustard, tincture of iodine, etc. All the congestions produced by these agents are due to reflex vascular dilatations. The physical irritants produce effects of the same kind as those occurring through the influence of cold and heat. Cold causes especially a reflex congestion when there is primarily a contraction of the vessels. Heat may cause reflex vascular dilatation either by direct contact or by radiation.

"Some very interesting experiments were performed by Waller to determine the phenomena caused by the application of ice to the ulnar nerve.* In these experimental conditions this physiologist has determined that the temperature of the little and ring fingers was primarily elevated a little; then when the paralysis of the muscles of the hypothenar region had become complete the temperature reached a maximum of 36° C. (96.4° F.) while that of the other fingers and the external portion of the hand descended from 32.7° (91° F.) (the initial degree) to 28° (82° F.). In the mean time it was discovered that the internal fingers became very red and that the arterial pulse was accentuated. Waller attributes the elevation of temperature which was noticed in the internal fingers to a paralysis of the vasomotor nerve fibres contained in the ulnar nerve. The lowering of temperature which appeared on the external side of the hand was due, according to him, to a derivation of blood. The ulnar artery having all its terminal branches dilated, the blood from the brachial artery flowed into this vessel in greater abundance than formerly, and the quantity of blood flowing in the radial artery suffered a reduction proportional to the increase in volume of that contained in the ulnar. It is the same effect, says Waller, that is produced when the sympathetic cervical nerves have been cut: the temperature is raised in one ear and lowered in the other.

"I return to the reflex phenomena. Electric irritations of the skin may produce cutaneous congestions by reflex action. Those who have given electricity to patients in the hospitals have certainly noticed the redness of the skin in the regions where the applications were made. The intense light caused by electricity may produce even at a distance reflex cutaneous congestions, without the intervention of the action of heat being required. Charcot" has related the history of two cases of erythema in which the affection of the skin had been manifestly produced by the action of the electric light. The experiments of Bouchard," of concentrating upon the skin of the forearm by means of a lens the solar rays which had passed through colored glass, have shown that the violet rays—*i.e.*, those which have the

* A. Waller: "On the Sensory, Motor, and Vasomotor Symptoms resulting from Refrigeration of the Ulnar Nerves." Proceedings of the Royal Soc. of Lond., 2, xi., 1862.

most powerful chemical influence—are those which cause the most powerful rubefacient and vesicatory action. These experiments have been confirmed by those of Charcot."

The reflex hyperæmias are observed not only at the point irritated, they may appear at distances more or less remote from this point. As an example of experimental physiology we recall the dilatation of the vessels of the ear of a rabbit under the influence of irritation of the proximal end of the sciatic nerve, although this nerve has no relation to that part of the animal except through the spinal cord.

Clinically, numerous similar facts may be observed. The congestions of the face secondary to a severe pain and a peripheral traumatism; the hyperæmias of the skin which are produced at a distance from the seat of injury in consequence of a burn, a traumatism, etc.; also the hyperæmias produced upon the surface of the skin and sometimes also in the subcutaneous tissues among subjects suffering from visceral lesions, and in regions which have a sort of direct anatomical relationship with the affected viscera—all belong to this class. For example, the redness of the cheek on the side corresponding to the lung affected by a unilateral pneumonia, pointed out first by Gubler; the hyperæmias which may appear in subjects suffering from pulmonary diseases—which has been called to the attention of the profession by Lépine; the hyperæmias of the face with a painful sensation of heat in the skin and sometimes of distress in the head, which are often observed among women during menstruation or at the menopause.

These reflex hyperæmias are of great importance in dermatology. Many of the congestions of the skin are without doubt of reflex origin and due to a nervous irritation, peripheral, visceral, genital, etc., and we ought always to have the possibility of this origin in mind when called to see a vasomotor neurosis of the skin. We should endeavor to find the starting-point of the reflex, in order to determine from that the appropriate treatment.

Anæmic or Ischæmic Dermatoneuroses.

The anæmic or ischæmic neuroses of the skin are related in a pathogenic sense to the hyperæmic dermatoneuroses. They are caused by contraction of the smallest arterioles and capillaries under the influence of the vasomotor system. We have seen above the intimate relations which exist between the cutaneous hyperæmias and anæmias.

The ischæmic neuroses of the skin may be general or local. Thus

we see a general pallor caused by mental emotions (fear, terror, anger, jealousy, etc.), or by violent irritation of the peripheral or splanchnic nerves. The direct action of certain morbific agents upon the vasomotor centres may also cause a general ischæmic neurosis of the skin, as is seen in a chill, for example. Certain poisonous substances may produce analogous effects.

The local ischæmic neuroses of the skin may result from peripheral irritations, as the application of cold, ether, bromide and chloride of ethyl, electrization, etc. In the course of diseases of the encephalon or cord, of certain psychoses, hysteria, or neurasthenia, local anæmias of the skin appear. All the peripheral cutaneous irritations may cause local anæmias, whose duration and intensity vary according to the nervous susceptibility of the individual and the intensity and duration of the irritation.

The reflex local anæmias secondary to lesions of splanchnic origin may likewise be seen in certain cases. I have known two subjects, mother and daughter, who, with the slightest dyspeptic trouble or indigestion, would have in the centre of each cheek a white, anæmic spot as large as a ten-cent piece. These spots remained sometimes for several hours.

Strong mental emotions (fear, anger, fright) may cause a local anæmia of the skin. Every one recognizes the pallor of the face which may appear under those conditions. I have had several patients in whom a strong mental emotion produced a very extensive pallor of the face. In one of them the tip of the nose would become absolutely colorless; in another similar spots appeared in the centre of each cheek; in others, a wax spot appeared covering almost the whole nose, the chin, and the lips. I have mentioned in my memoir upon the dermatoneuroses caused by mental shock the case of a lady with erythematous lupus whom I treated by linear scarifications according to the method of E. Vidal. The *séances* were held at intervals of eight days, and each time that she entered my office the nervous patient experienced, as she expressed it, "comme une commotion violente de tout son être." Almost immediately the fingers of her hands became white and presented all the phenomena of local syncope of the extremities. Except for these paroxysms, due to true mental shock, the patient never showed any signs of local syncope, not even when she exposed her hands to the severest cold. The ischæmia of the fingers lasted about a quarter of an hour after the scarifications.

In certain cases, and here we approach the condition of local syncope of the extremities, a pronounced and lasting anæmia of the skin of the fingers and hands may be produced by the influence of cold.

Several cases of anæmia of the extremities, accompanied by neu-

ralgic pains and diminution of sensibility, were observed by Nothnagel in subjects who in their work were obliged to put their hands often into cold water. Eulenburg, in his "Lehrbuch der Nervenkrankheiten," has called attention to analogous anæmias in the line of distribution of certain nerves. These cases closely resemble those of Raynaud's disease, which we will now study.

Syncope, Asphyxia, or Symmetrical Gangrene of the Extremities (Raynaud's Disease).

Under the name of local syncope or asphyxia, or of symmetrical gangrene of the extremities, Maurice Raynaud[4] has described a kind of symmetrical cramp of the vasoconstrictors which may finally terminate in gangrene.

As this disease in the beginning presents symptoms of local syncope and asphyxia, *i.e.*, purely vasomotor phenomena, which may remain indefinitely; and since the symptoms of gangrene, when they appear, do so almost always after a more or less prolonged period of asphyxia or syncope, the affection should be studied with the vascular neuroses of the skin, although in its final stage it belongs among the trophoneurotic ulcerations, gangrenes, etc. This shows at once how difficult it often is to draw the precise boundary between the vascular and the trophic dermatoneuroses.

Local asphyxia is the primary symptom of this disease. It almost always precedes the gangrene but is not the cause of it.

The local asphyxia assumes one of two forms. "Sometimes," says Raynaud, "the extremity which is attacked becomes completely exsanguinated and decolorized; this appearance resembles the sudden pallor of the whole body which accompanies a momentary arrest of the heart's action. The name of local syncope may be given to this condition of the peripheral circulation. Soon the supply of arterial blood seems to fail, and the extremities become a livid color; this is an indication of stasis of blood in the capillaries, and is local asphyxia properly so called. But these two conditions merge into each other, and in fact they may alternate so that the parts may be seen to change their appearance even at the time of the examination. More than that, one finger or toe may show a complete absence of color of certain parts and a cyanotic tint in others so that it is impossible to separate completely the two descriptions.

"In its simplest form, local syncope is a condition perfectly compatible with health. Those attacked, usually women, note that one finger or several fingers all at once become pale and cold under the slightest influence or even without any appreciable cause. In

most of these cases the same finger is always attacked first, and the others follow in succession and always in the same order. This phenomenon is known by the name of 'dead finger.' The onset is slow, and the duration varies from some minutes to several hours. Cold is frequently the exciting cause; but this phenomenon, which usually is not produced except by very severe cold, comes on in the subjects of whom I am speaking with the slightest fall of temperature; sometimes even it is a simple mental impression. It seems that the same cause which acts upon the capillaries of the face and causes the blush to mount to the cheek, as we say, can under other circumstances exert its action especially upon the capillaries of the extremities.

"The skin of the affected parts assumes a dull white or sometimes yellowish tint and appears completely exsanguinated. The cutaneous sensibility is deadened, then destroyed; the fingers are as if separated from the body. They may be pinched or pricked with impunity; but although they may lose the tactile sense yet they are able to distinguish heat from cold. Their temperature is reduced, as can easily be ascertained by touching them. Should the loss of motion in these cases be attributed to a momentary paralysis of the flexor and extensor muscles? That is scarcely probable when it is remembered that this condition of syncope often affects a single finger, while one muscle has several tendinous insertions in the different fingers. It is more rational to assume that, the affected part no longer transmitting sensations to the brain, the latter loses momentarily, in default of stimulus, the power of causing movements. In these rare cases the secretions are likewise disordered, and the 'dead finger' is covered with a cold perspiration. This local abolition of the circulation is really of very considerable importance although it is but transitory. The fingers are not alone subject to it, and if they appear more frequently affected it is only because they are more important in the actions of daily life than the toes, and their troubles are consequently more apparent.

"The paroxysm is followed by a period of reaction, often very painful, which gives place to a sensation of numbness. This must not be confounded with that numbness which follows concussion or compression of a nerve. In the latter case sensation and motion are primarily affected, the circulation remaining normal, while precisely the opposite occurs in local syncope. When the latter, instead of involving several fingers, affects only one, then the disorders of circulation, the existence of which we have been obliged to assume through a process of induction, become very evident. The pulse may become almost imperceptible at the time of the paroxysm.

"In the most marked cases (those in which the symptoms of as-

phyxia predominate), the decoloration of the limbs is replaced by a cyanotic hue. Sometimes this is a bluish white, the skin seems to have become very transparent, permitting the subjacent tissues to be seen; at other times it is a deep violet color, inclining to black, looking very much like an ink spot in the skin. When pressure is made upon the parts thus shaded the waxy white spot caused by the pressure, instead of instantly disappearing as happens on a healthy limb, remains for a considerable time before resuming the color of the surrounding parts, an evidence of excessive slowness of the capillary circulation. Generally the neighboring joint is involved; very frequently also there is a livid, venous marbling upon the legs and thighs.

"Pain is an almost constant symptom in this disease. It may be sufficiently severe to elicit cries from the patient. There is first a painful numbness, followed by a sensation of burning and darting which is increased by pressure. Yet anæsthesia of the skin is complete and makes the grasping of objects of small size almost impossible. The period of reaction is accompanied by smarting and tinglings, which the patient compares to the stinging or burning of nettles. Then less livid spots appear upon the cyanosed parts; these extend and coalesce and at the same time a vermilion color appears at their border; this color spreads gradually, driving before it the bronze color, which persists the longest in the places where it originated, that is to say, in the parts most distant from the centre. Finally a deep red spot appears at the tips of the fingers; this spot changes to a good flesh color and then finally the skin returns to its primary condition.

"*Symmetrical gangrene* begins in various ways. The two conditions which we have just described may combine in several ways. In the first case the parts appear exsanguinated and pale, and then assume a lilac tint, and there are tinglings, dartings, and numbness; the ends of the fingers become of a violet hue. In the second case a livid redness first appears and the patient is supposed to have chilblains; but soon the pain becomes more and more acute, and a livid marbling appears in the vicinity. The fingers soon become black and insensible, a small phlyctena filled with a sero-purulent fluid develops, ruptures, and leaves the derma bare. It appears like the beginning of a serious gangrene, but it is not, for after a few days the parts become reanimated, cicatrize, contract, and there remains a kind of conical tubercle often immediately subjacent to the nail." [4]

The recovery is only temporary since the same series of phenomena is repeated. Raynaud has seen the condition repeated thus during a period of two years, always with slight intervals of remission. At a more advanced stage we find upon the pulp of all the

fingers a great number of small white depressed cicatrices, very hard, which are, as it were, the stigmata of the disease, and the existence of which proves that the process is not arrested by the epidermis, but that it reaches the superficial layer of the true skin. All the nails may fall off simultaneously.

That which is most striking in this form of the disease is the thinness of the ends of the fingers, the hardness of their tissue, and their withered, parchment-like appearance. This parchment-like appearance may come on without previous blistering; the skin takes on a fawn color; it is thin, dry, and wrinkled, and the fingers become conical in shape. Finally, a kind of desquamation is noticed, a thick pellicle of woody hardness coming away in shreds. At other times (especially among children) the phlyctenæ do not burst, but dry up after some days; the fluid is absorbed, the epidermis turns brown and is detached in pieces, the skin beneath, which is rose colored and very smooth, soon returning to its normal appearance.

The gangrene may also come on suddenly without phlyctenæ. There is then a tendency to mummification, the nail becomes completely black, and the whole phalanx grows more and more discolored and at last becomes black as carbon. At the end of several days an irregular line of demarcation forms at the base of the digit. Suppuration is established all around, the eschar becomes loose and is detached. It is of little depth and not more than a millimetre thick. Numerous granulations appear and cicatrization proceeds rapidly.

These various forms may all be found in the same subject in severe cases, and may appear simultaneously at several points of the body. An important symptom is the pain, which soon assumes a frightful intensity. It does not remain fixed in the end of the limb but radiates throughout its whole extent. It is a sensation of burning and of tearing which comes on in paroxysms, coincident with a manifest increase of the cyanosis. It may draw cries of suffering even from the most gentle and patient. Sometimes also, in the intervals of the crises, the patient is extremely irritable (Raynaud).

A remarkable fact is the integrity of the other functions and even of the nutrition in the neighboring parts. Thus Raynaud dwells upon the strange spectacle of a nose almost entirely black in the midst of a face fresh and red. Respiration, digestion, etc., are perfectly normal. It is noted that sometimes a mental prostration may exist up to the point of hebetude. The circulatory apparatus does not usually present any special change, although in one case we observed a mild degree of atheroma.

In a recent case, which has some importance from the point of view of pathological physiology, Raynaud has observed irregularities

of vision and has noted by means of the ophthalmoscope a peripheral contraction of the central artery of the retina.

The usual site of the lesions which we have described is upon the extremities (fingers or toes); less commonly the nose and ears. Gangrene of these latter parts is, however, extremely rare. Thus Raynaud wrote in his thesis in 1862: "The nose and the external ear sometimes are more or less affected, but I do not think a complete mortification has ever been seen. The lobule and the alæ of the nose may present, it is true, a black discoloration, the livid marbling extending even to the cheek; but this color disappears on pressure, to reappear again. The parts become gradually reanimated without even passing through the stage of desquamation."

Ten years later Raynaud republished the same passage and added: "Only once have I seen the formation of very small cicatrices on the tip of the nose."

Thus Raynaud, who has studied more carefully than any one else these cases of symmetrical gangrene of the extremities, found but once true eschars upon the end of the nose or the ears. Since then Fisher[*] has published another similar case. The rarity of this localization does not remain less firmly established. For this reason interest has been aroused by the observation of Grasset,[*] recently published, where the symmetrical gangrene not only attacked the end of the nose and the ears, but was exclusively located in these regions. I have also seen two cases of symmetrical gangrene where the disease was absolutely localized in one case at the tip of the nose and upon the ears, and in the other upon the ears exclusively. In these two cases the subjects were arthritic and neuropathic women, whose parents were of similar diathesis. One of the patients had, besides, contracted intermittent fever in Holland.

As Vulpian has remarked, perhaps the term symmetrical gangrene excludes certain cases which ought to be included in the same group with those to which this name is justly applicable.

Gubler has related a case of gangrene of the toes observed in a young woman who did not present any sign of obliteration of the arteries in the corresponding limb. Similar cases can be found in Grasset's work. Some years ago I was called in consultation to see a very talented painter who was suffering with gangrene of the skin of the toes and of the dorsal aspect of the foot, following the phenomena of local asphyxia and syncope of the toes and a part of the anterior region of the foot. This gangrene having necessitated an amputation of the leg at the lower third, I was able to determine the absolute integrity of the vessels; but, on the other hand, I found a pronounced neuritis of all the nerves of the lower limb. It is evident

that in certain respects this case ought hardly to be regarded as a symmetrical gangrene of the extremities, and should rather be studied in the group of general trophoneuroses of the skin, but I thought best to mention it here on account of the local asphyxia which preceded the appearance of the gangrene. Moreover these cases, even though the gangrene is unilateral, do not differ essentially from those of symmetrical gangrene of the extremities.

A symptom which has not been pointed out by other authors, as far as I know, and one which I have had occasion to observe in three cases, is hyperidrosis of the fingers affected by the asphyxia—a hyperidrosis especially marked at the time of the crises of local asphyxia. In two of these cases after the paroxysm of local asphyxia appeared, on recommending the patients to plunge their hands into cold water, I was struck by the abundant perspiration which came out on the surface of the asphyxiated fingers and upon the cold skin.

Prognosis.

This is relatively favorable in the great majority of cases, and it is an interesting fact, since dry gangrene is always a serious matter wherever situated, so serious, indeed, that Fabrice de Helden in a practice of forty years declared that he had not seen a single case of recovery.

"When we recall," says Raynaud, "a picture such as I have tried to portray—viz., the presence of atrocious and persistent pain, that deep black color involving at once the hands even to the base of the fingers, the feet even to the tarsus, the nose to the roots, what physician is there, who seeing his patient dying so to speak by inches, would not, unless forewarned, regard the prognosis as most gloomy? But far from the issue being progressively fatal it is important to know that recovery is the rule. I have never seen a patient succumb to the disease, and I have had one under observation for more than thirteen years. Those who have died have been carried off by diseases entirely distinct from the primary affection. The only exception to this rule was a case observed by Professor Gubler in which death seemed to be caused by progressive exhaustion. There was no autopsy, however, and we ought, therefore, to be very guarded in our conclusions concerning the case.

"The progress of the disease constitutes an important prognostic element. When ten or a dozen years after the onset of severe pain we see black and dry eschars form symmetrically, there is a hope that the work of mortification will be arrested soon, and that after a period of elimination, the duration of which will hardly exceed at the

most four or five months, recovery will be complete. If, on the contrary, the tendency to gangrene is less plainly marked, if we find only coldness, some cyanosis, and phlyctenæ recurring from time to time with or without periodicity, we have to fear that the disease will last a considerable time; and this form, although it may not immediately endanger life, is perhaps the more troublesome because it makes life a burden on account of the terrible suffering and the permanent obstacle which it presents to the performance of all social functions."

After a time it causes quite frequently a kind of sclerema of the affected parts. In certain cases local asphyxia has preceded the appearance of sclerodactylia, as I have shown several times in my clinics. Apollinario and Grasset have related a very remarkable case, as have also Bouttier[37] and Lewin and Heller.[38] About the same time that I observed the above case of sclerodactylia I saw a most remarkable case and one which, I think, is entirely unique in medical literature. In the patient who was the object of this observation, the asphyxia affecting the hands, the nose, the cheeks, and the ears not only preceded the scleroderma of the fingers (sclerodactylia) but had served as a starting-point (something which has not yet been pointed out, so far as I know) for a circumscribed scleroderma, resembling morphœa, which involved the regions of the face previously affected by the local asphyxia—*i.e.*, the nose, the zygomatic regions, the cheeks, and the ears. I might add that in this woman there was present in addition a pronounced hyperidrosis not only of the fingers, but of the portions of the face affected by the local asphyxia followed by scleroderma; she had also suffered from vitiligo of the face, neck, and scalp, and from spots of trophoneurotic alopecia seated in portions of the scalp where the hair had become gray.

In a recent case, I saw the sclerodactylia consecutive to local asphyxia of the extremities result in mutilations of the fingers, consisting in almost complete absorption of the last phalanges with alterations in the nails. In the young girl the subject of this observation (whose case I was tempted to report in my articles upon the remains of ancient leprosy in the regions of France where leprosy has long since disappeared) there existed, besides, a number of a sort of small perforating ulcers of the palmar surface of the middle and index fingers and the thumb. Apropos of this case, we may recall the fact that Grasset has contended that local asphyxia of the extremities and scleroderma ought not to be considered as two distinct diseases since they are frequently found one following the other in the same subject. Grasset would regard them simply as varieties of the same disease, or rather as clinical syndromes, which may be the manifestations of the same disease.

Etiology.

Women are more subject to this disease than men; they represent nearly four-fifths of the subjects affected. In several cases suppression of menstruation has been noted at the beginning of the disorder, and its reappearance when recovery has taken place.

The usual age seems to be from fifteen to thirty-five. It is, properly speaking, a gangrene of the young rather than of adults. The nervous temperament has been often observed, but not always. The action of cold is undoubtedly a factor, especially in the production of the early lesions, yet care must be taken not to mistake simple congelation for Raynaud's disease.

The disease, when once started, passes through its evolution as perfectly in summer as in winter. Raynaud found in one case the coexistence of diabetes mellitus and local asphyxia. But in a general way he does not admit that previous disease is an etiological factor. Since the publication of Raynaud's work some new facts have been brought to light which deserve mention in this connection. Intermittent fever has been observed several times. In 1869 Rey [39] published the first case observed in a man who had had the fever in Senegal and had suffered a relapse on his arrival in France. In 1873 Mourson [40] noticed a local asphyxia following an attack of intermittent fever and called special attention to the coincidence.

Fischer [41] has also seen a case of the same kind, and Calmette [42] has devoted an article to reports of local asphyxia of the extremities in connection with malarial intermittent fever. I have observed three cases which seem to strengthen this conclusion.

Everybody now admits with Raynaud that local asphyxia of the extremities is due to a spasmodic contraction of the small vessels, of nervous origin. Weiss regarded it as an unrecognized disease of the central nervous system, basing his opinion upon the fact that this affection may often be associated with disorders of sensation, motion, and speech and with partial atrophy.

Hemorrhagic Dermatoneuroses.

Aside from the various neuroses of the skin in the course of which cutaneous hemorrhages may appear at the site of the lesion secondary to disorders of the nervous system, such as hemorrhagic urticaria, zona, etc., it is certain that in many cases diseases of the central or peripheral nervous system may occasion hemorrhages in the skin. As Vulpian has written [43]: "It is known that congestion, carried to a certain degree, may cause a hemorrhage, which may be due to

either a simple diapedesis of the red globules or a more or less serious rupture of the vessel. Consequently, the hemorrhage, as well as the congestion, may be caused by a modification of vasomotor function in the organ in which the sanguineous extravasations occurs. The hemorrhage is, moreover, favored by preëxistent changes which both the vessels and the blood may present."

Although the cases are rare, yet cutaneous hemorrhages have been noted after lesions of the peripheral nerves, and in the course of certain neuralgias. Parrot[1] in 1859 called attention to the appearance of cutaneous hemorrhages and hematidrosis during paroxysms of a neuralgia which was extremely severe and variously located. Weir Mitchell[2] says that he has noticed petechiæ in the course of neuralgic attacks in anæmic women. Faisans[3] speaks of three cases of ecchymoses occurring during a neuralgia of the sciatic in the region controlled by the inflamed nerve. I have seen five similar cases. Verneuil[4] has shown that the traumatic neuralgias may cause congestions and secondary hemorrhages, and that quinine is the best remedy to control these hemorrhages.

Bouchard and Simon have produced cutaneous hemorrhages in animals by section of the sympathetic nerve.

Gley and Mathieu (Société Anatomique, 1887), repeating the experiments of Lewaschew, which consisted in passing a wick saturated with a concentrated solution of chloride of sodium through the sciatic nerve of a dog, did not find the lesions of the arteries which the previous observer had noted, but they noted the presence of dermic and subdermic capillary hemorrhages, and thus produced experimentally purpuric spots by lesions of the nerves.

Boeck has seen a multiple neuritis begin with an eruption of purpura which he attributed to the nervous changes.

Reflex Hemorrhages.

Independently of the hemorrhages which occur during the course of a neuralgia, there are cases where it is difficult to believe that the cutaneous hemorrhages and ecchymoses are not in relation with a reflex irritation of the vasomotor nervous system. Such, for example, are the ecchymoses which occur on the lower limbs in the course of uterine diseases of various kinds. The intervention of the vasomotor apparatus cannot be doubted either in these cases or the vicarious hemorrhages which occur in women who are irregular in their menstruation or whose menses have been suddenly checked from any of the various causes.

Hemorrhagic Dermatoneuroses Secondary to Lesions of the Cord.

As has been shown by the investigations of Brown-Séquard, Charcot, Vulpian, Bouchard, Schiff, and others, the lesions of the cord may cause hemorrhages in various situations, generally visceral but in certain cases manifested in the skin.

Straus [1] was the first to explain the relation which exists between certain cutaneous hemorrhages and the spinal lesions of tabes. "The tabetic ecchymoses," he says, "appear, in a certain number of ataxic subjects, upon the skin of the limbs, following severe crises of fulgurating pain, and their appearance coincides always with the abatement of the pain. The appearance of the evolution of these spots is identical with that of the ecchymoses which result from a quite severe contusion (commonly called black and blue spot) or from a strong pinch of the skin; only these spots are entirely without pain, either spontaneous or provoked by pressure, while the ecchymoses caused by a blow are always more or less painful. The spots vary greatly in shape and number, their extent and the intensity of the discoloration are generally proportionate to the duration and the severity of the painful crises which give them birth. The spots are almost always situated on the limb which is the principal seat of the tabetic pains; but instead of appearing upon that portion of the skin which corresponds to the seat of maximum pain, they may come out higher up near the origin of the limb. The distribution of these ecchymoses bears no relation to the course of the cutaneous nerves, differing in that respect from the tabetic eruptions described by Charcot." In regard to the frequency of the appearance of these spots Straus adds: "I do not think it an exaggeration to say that these phenomena are very common."

Cutaneous hemorrhages have also been observed in the course of the diffuse or more or less local lesions of the cord. Faisans has seen them in transverse myelitis and in secondary cancer of the spine. I have seen one case where the cutaneous hemorrhage, situated upon the lower limb, was a true *dermatoneurose indicatrice* of a meningo-myelitis the existence of which was confirmed at the autopsy.

In one observation of Troisier, made in the service of Vulpian and published in his "Thèse de Paris" by H. de Chateaufort (1878), ecchymoses of the forearm and the thighs played the rôle of a *dermatoneurose indicatrice* of tubercular lesions of the cord and its meninges.

Brown-Séquard, Charcot, Schiff, and others have shown that vari-

ous hemorrhages may occur under the influence of lesions of the brain, and Charcot has called attention to the ecchymoses of the skin in cerebral apoplexy.

Hemorrhagic Dermatoneuroses Caused by Mental Shock.

As Mathias Duval has remarked in his excellent article "Vasomoteurs," Hitzig, Eulenburg, and E. Landois having shown the probable existence in the cerebral cortex at the level of the frontal parietal convolution of cortical vasomotor centres whose destruction causes an elevation of temperature in the limbs on the side opposite to the lesion, "it is not difficult to admit that the cases of purpura occurring in consequence of mental shock may find their interpretation in an interference with these cortical centres."

The observations regarding cutaneous hemorrhage consecutive to mental shock are in fact quite frequent. Parrot in 1859 collected some remarkable cases. Since then these cases have multiplied, and we find in the literature numerous examples of purpura following violent mental shock (anger, fear, intense sorrow, etc.).

Lancereaux, in his work on pathological anatomy, relates the history of a young artist employed in the museum at Fontainebleau who happened accidentally to break a precious work of art. He was greatly distressed, and in the evening developed a hemorrhagic purpura of which he died at the end of four months.

I have published in my memoir upon the dermatoneuroses caused by mental shock a certain number of cases of this character. As I there insisted, in these cases, as in all the neuroses of the skin due to mental shock, various nervous phenomena are noticed preceding the eruption by a longer or shorter interval.

Neuropathic Hemorrhagic Dermatoneuroses.

Among neuropathic and neurasthenic subjects, but especially among hysterical women, we see quite frequently cutaneous hemorrhages of nervous origin having for their exciting cause a decided change in certain portions of the vasomotor system.

These cutaneous hemorrhages of nervous origin, of which the most common are spontaneous ecchymoses, appear without any traumatism and unaccompanied by symptoms of scorbutus or hæmophilia, with which they are often confounded. Recognized for a long time, and classed often by the older authors with the stigmata, they are now admitted to be independent affections of quite frequent occurrence. They may sometimes appear spontaneously in neuropathic or hysterical subjects, but ordinarily they are caused by more or less ac-

tive and oft repeated mental emotions. They may also come on in consequence of mental shock.

The phenomena of suggestion and auto-suggestion often play a very important rôle in their production, and many of the stigmatics of the sixteenth and seventeenth centuries, and even of more recent times, were nothing but neuropathic and hysterical persons affected with cutaneous hemorrhages caused by suggestion or auto-suggestion. As the works of Charcot and Bourneville clearly show, and as may be seen in the memoir of Barthélemy [1] upon dermographism, and in the thesis of Athanassio [2] upon the trophic disorders in the hysterical, we have here to do with vasomotor phenomena dependent upon a change in the nervous system.

Gilles de la Tourette remarks upon the special physical tendency which hysterical subjects have to develop vasomotor disorders of the skin of nervous origin.* The vasomotor disturbance is accentuated to the highest degree by suggestion, whatever may be the condition in which this is presented. There may thus be produced in any portion of the body not only red streaks, but even cutaneous hemorrhages, apparent burns, wounds—stigmata in a word, which in some cases may persist for three months.†

Gilles adds: "A still more important circumstance is the power of suggestion and of auto-suggestion, honest and spontaneous as I believe it to be, which produces not only irregular hemorrhagic spots or patches, but even stigmata, such as figures of the cross, emblems, letters, names, etc. This auto-suggestion is quite evident; and not only can it cause the stigmata to appear at certain times, but it can cause them to disappear permanently." [3]

Although these cutaneous hemorrhages may appear in various portions of the body, *e.g.*, the lower lip, the face, the forehead, the nails, the ears, etc., they are found more commonly upon the trunk and the limbs.

It must be noted that among certain subjects influenced by suggestion or auto-suggestion, these interstitial hemorrhages as well as bloody sweat appear often at points to which the attention of the patient has been drawn by his imagination or self-contemplation.

Sometimes these ecchymoses are ushered in by pain; at other times, in contradistinction to the tabetic ecchymoses, the pain does not appear until the ecchymoses show themselves. Once formed they behave like other ecchymoses. Quite frequently they are pre-

*See observation upon Sister Jeanne des Anges in Barthélemy's work upon Dermographism, p. 166.

†See "Comédie du Bois d'Haine" par Hubert Boens, Brussels, 1876. "Louise Lateau ou la Stigmatisée belge" par Bourneville, Paris, 1878.

monitory symptoms of an hysterical attack, but usually they appear in consequence of this attack, as Bourneville and Bégnard have proved.

The possible occurrence of these hysterical ecchymoses as well as of hemorrhages of the same nature should be recognized by medical jurists, it being admitted at the same time that simulation and falsehood are very common among hysterical subjects.

The auto-suggestion of a dream at night or of an hysterical attack may produce physical stigmata, and especially the spontaneous ecchymoses which are met with in epidemics of possession among the hysterical, who think they have been plagued by a demon or beaten and bruised by the devil; or among fanatics who have dreamed of being flagellated like Christ, and who show these ecchymoses as undeniable evidence of the blows which they say they have received.

But very often when these ecchymoses are few in number and not well marked, and when they occur in subjects whose neuropathic and hysterical condition is not very apparent, they may be neglected, overlooked, or mistaken for some other affection. I know a very nervous dermographic lady who had come to consult me for an urticaria which appeared at times, disfiguring her face and hands of which she took great care, who said to me that she had from time to time, especially near the menstrual period, upon the legs and sometimes the arms, some large bluish spots, lasting several days, just as if she had received blows. But she watched herself closely, and was very certain that she had received no injury. She noticed that these spots appeared especially at the time of menstruation when she was enervated. I had occasion to observe this same lady for some time and to be convinced that the ecchymoses were of a spontaneous nature in a hysterical subject.

Some years ago a young woman and her mother came to me and asked for a certificate, stating that the younger lady bore black and blue marks upon her arms and legs as well as upon the breast. These black and blue marks were caused, according to the statement of the woman, which was vigorously supported, I should say suggested, by the mother, by blows which her husband had inflicted upon her during sleep. The desired certificate was to be used in an application for divorce. I examined the woman, and did in fact find a certain number of ecchymoses upon the arms, the breast, and the lower limbs but none upon the face. These ecchymoses were nearly all about the size of a two-sou piece. I found also that the woman was strongly dermographic (urticaire provoqué), that she had ovaritis on the left side, that she did not distinguish colors well with the left eye, and that the skin of the left upper extremity was anæsthetic. I then refused to give any sort of certificate despite the entreaties of the lady

and of the mother-in-law. It was well I did, as I learned afterwards that the divorce was not granted and that, the mother-in-law being dead, the husband and wife now led a happy married life. I do not know whether the young woman still continues to have ecchymoses, but I am certain that if she does she must attribute them to a very different cause from that which she alleged when she came to me.

But it is in works devoted to cutaneous hemorrhages and to hysterical stigmata that we find more particularly the histories of spontaneous ecchymoses. There is scarcely a report of hemorrhage from the skin in which there were not ecchymoses, the first degree of hemorrhage. We may consult with profit on this subject the writings of Magnus Huss, Astley Cooper ("Nervous Diseases of Women"), Parrot, Athanassio, Barthélemy, and others.

HÆMATIDROSIS.

This affection is a glandular dermatoneurosis, and belongs properly to the chapter on glandular neuroses of the skin, but all of the glandular dermatoneuroses, such as hyperidrosis and seborrhœa, belong to the trophic forms of these affections, while hæmatidrosis is a hemorrhagic glandular neurosis. "Bloody sweat," says Vulpian, "is a more or less abundant exudation of blood through the skin, which may last from a few seconds to several days. It generally depends upon hysteria. Recognized since the time of Aristotle, perhaps since that of Hippocrates, it was attributed by the ancients to more or less absurd causes."

In 1859 Parrot[1] made an exhaustive study of the question; his analysis of the blood exuded in hæmatidrosis revealed the constant presence of a great number of red corpuscles, occasional white corpuscles, and fragments of epidermis in the midst of a colorless and transparent fluid.

"By what channel does the blood pass out of the skin? There are two kinds of openings on the cutaneous surface, one belonging to the sudoriparous glands, the other to the hair and sebaceous follicles. According to Gendrin, there is no doubt that the blood escapes from the mouths of the sweat glands. That is the only tenable opinion when the hæmatidrosis appears upon the pulp of the fingers and upon the plantar surface of the toes. But what about the other portions of the body? Magnus Huss (observation xviii.) thought that in a young girl placed under his care, the hemorrhage was consecutive to a rupture of the capillaries which nourish the hair bulbs, the sebaceous follicles, and the ceruminous glands of the ear. The only portions of the surface of the skin, he says, which excreted blood were, with the

exception of the external auditory canal of the left side, those which were covered by the hair or beard, the scalp, the margin of the eyelids, the left axilla, the circumference of the left nipple, and the pubes. He adds that he could see by means of a magnifying glass the blood filtering out around the roots of the hair. This case is reported with almost too great detail to be convincing. The rapidity with which hæmatidrosis comes on, the effusion which sometimes is abundant in a very short time presuppose on the one hand perfectly free exits, and on the other, abundant vascular supply to the organs which are the seat of the disorder. The sebaceous glands hardly fulfil this double condition. Throughout their entire extent they are filled and obstructed by an almost solid material occupying the space between the hair and the epidermis; the vessels which are distributed to the lobules of these glands or in their interspaces are few in number, and we find the capillaries abundant only around the large glands, such as those of the pubes, the scrotum, and the ear. The sudoriparous glands present a considerable development just in the regions where Magnus Huss saw the exudation of blood in his patient, and where the sebaceous follicles, on the other hand, are relatively small and feebly developed. Huss thought that the blood which appeared upon the margin of the eyelids came from the ciliary follicles, but it seems rational to suppose that the source was the lacrymal glands. Regarding the blood from the external auditory canal, it came, says the Stockholm physician, from the ceruminous glands, but these are identical in form and structure with the sweat glands. The conclusion is that while the seat of hæmatidrosis is generally the sudoriparous glands, the hypothesis that it may have its origin in the sebaceous glands is not wholly untenable.

"The mechanism of a neuropathic hæmatidrosis is quite obscure. It is probable that it occurs, as I have just said, from a hemorrhage arising from the blood-vessels of the sudoriparous glands. It is probable also that the blood exudes by diapedesis, owing to an increase of pressure in the capillaries and venules of the glands. The sanguinolent fluid seems to spring from the orifices of the sudoriparous glands, and we find it there, as Parrot clearly determines, in the form of numerous red globules. Is there at the same time an exaggeration of the secretion of the sudoriparous glands which are the seat of the hæmatidrosis? This is a point on which accurate information is absolutely wanting.

"Hæmatidrosis from a neuropathic cause appears to be due to a momentary paralysis of the vasomotor centres which control the vessels of the sudoriparous glands. The paralysis may be caused by a strong irritation of the sensitive fibres, whose peripheral extremi-

ties are distributed in the regions of the skin which are the seat of the hæmatidrosis. This is doubtless what takes place when the bloody sweat appears in those regions of the skin where there is an intense neuralgic pain. We may explain in this way also those cases in which the hæmatidrosis appears at the same time as the severe neuralgic pain, but in another region than that which is the seat of the neuralgia. Finally, there are cases where the hæmatidrosis seems to be preceded, not by neuralgia, but by neuroses of various forms. It may be supposed in these cases that the same vasotonic centres of the vessels of the sudoriparous glands in different regions have been affected by a shock which paralyzes them for a certain time. It is very reasonable also to suppose that local predispositions exist among those who have this sweating of blood; for the neuropathic conditions in which these phenomena are observed are not of exceptional character, and yet hæmatidrosis is extremely rare" (Vulpian).

Etiology of the Hemorrhagic Dermatoneuroses.

In the hemorrhages which we have studied above, the nervous origin is hardly questionable, nevertheless it is probable that a certain local or hemorrhagic predisposition exists among those who suffer from cutaneous hemorrhages, especially from hæmatidrosis. The nervous conditions under which these phenomena arise are not very uncommon, and yet hemorrhages of the skin, especially those of neuropathic origin, are extremely rare.

Should we place among the hemorrhagic neuroses of the skin the hemorrhages which occur in cases of poisoning, in certain forms of auto-intoxication, and in the infectious diseases, and also all forms of purpura? I do not think so.

Among the different varieties of purpura carefully studied by Mathieu in his article "Purpura" in the Dictionnaire Encyclopédique des Sciences Médicales, there are two groups which may be said to be cutaneous diseases of nervous origin. These are:

1. The rheumatoid exanthematous purpura of Mathieu, which has been called exanthematous purpura.

This morbid group presents an entire series of related facts and we may include in it the nervous purpura of Hénocque, the myelopathic purpura of Faisans, Schönlein's peliosis, etc.

2. The non-febrile hemorrhagic purpuras, of sudden onset, described by Mathieu. This is the type of Werlhof.

But even these forms depend evidently upon causes acting upon the entire organism. Certain recent works have even shown that in some cases these purpuras ought to be considered as dependent upon

a general infection; that in other cases their bacterial origin is very probable, and that those who regarded them as eruptive fevers were not far out of the way.

We see therefore that the etiology of purpura is not always easily determined, and in many cases a detailed examination of the phenomena will demonstrate that various causes are acting together.

The alteration of the blood, the disorders of the circulation, the lesions of the vessels, and the derangements of innervation may all coexist in the same subject as the pathogenic cause of cutaneous hemorrhage. It is reasonable to assume even that the purpuric dyscrasia may be, in certain cases, the origin of secondary lesions of the vessels, such as an endarteritis. And on the other hand it is probable that alterations of the blood frequently induce changes in the central or peripheral vasomotor nervous system.

It must therefore never be forgotten, when studying a case of purpura, that the pathogeny may be complex. And if this pathogenic complexity is recognized, we must determine the relative importance of the different causes, endeavor to discover the relation which exists between the determining, predisposing, and exciting causes and the occasional or secondary causes."

Urticaria.

Some of the statements which I made above in regard to the erythemata and the angioneuroses are applicable to urticaria.

It is absolutely certain that in the pathogeny of urticaria, poisoning by food and drugs and the auto-intoxications often play a very important part. But that which stands first in urticaria and gives it at once a specific character is the peculiar irritability of the general nervous system in those who are affected by it.

It is understood that in making these statements, I have not in mind the urticarias due to external irritants secreted by animals or vegetables (jellyfish, nettles, caterpillars, lice, bedbugs, or mosquitos). To be sure these urticarias are secondary to an irritation of the vasomotor system, and the more sensitive the skin the greater is the disturbance which these agents produce when they come in contact with it. But these urticarias have a pathogeny so separate and so special that they ought to be considered by themselves.

The same is not true of the urticarias from internal causes. Here, whatever may be the exciting cause, the true primary cause is the special susceptibility of the vasomotor nervous system. This neurovascular cause is so evident that these urticarias may be placed without hesitation among the vascular dermatoneuroses.

Pigmentary urticaria seems, as far as our present knowledge goes, to constitute a well-defined dermatosis and it ought therefore to be studied in a separate chapter.

From a histological point of view urticaria may be considered as resulting from atony of the cutaneous vascular papillæ. This atony appears to be usually of neuroparalytic origin, as we can readily see in the case of certain nervous subjects or in the course of some serious disease such as tuberculous meningitis or typhoid fever. If, in such a case, the skin be scratched with any kind of a pointed instrument so as to form a design or letters, it at once becomes pale and contracts along the line of the design. This shows that the contractile elements of the vessels have become active. A little later the design suddenly appears in red, which demonstrates that the vessels have dilated. Soon there springs up along the red line a row of elevations which rapidly unite to form a prominent ridge. This ridge becomes paler and gradually takes on the appearance of an œdematous streak. And we have before us an artificial urticaria. We can follow in this formation of an urticarial wheal all the stages of the reflex vascular neuroparalysis: the anæmia due to contraction at the beginning, the hyperæmic relaxation, and the production of œdema.

In certain cases, in addition to the œdema, when the intravascular pressure is extreme and when the capillary loops are gorged with red blood corpuscles, hemorrhage may also be produced. There is then formed a papule of hemorrhagic urticaria, analogous physiologically, pathologically, and histologically to the acute œdema of the eyelids followed by ecchymosis which occurs in consequence of certain neuralgias.

Therefore it is seen that among certain predisposed subjects an external contact, which would excite no action in the skin of a healthy subject, causes the formation of lesions whose design corresponds to that of the tracing made upon the skin.

This dermographic condition of the skin, which has been designated nervous urticaria, has been especially and carefully studied by Barthélemy.[31] As he has remarked, it is only by chance that the discovery of dermographism in a subject is made. Sometimes this discovery has been made when the patient scratched himself or when pressure of the clothing caused urticarial wheals. The slightest touch is sufficient at times to produce this result. One of my patients complained that she could not be kissed without great wheals appearing on her face, and another girl jumping rope had her face all marked up by the simple grazing of the rope.

A patient of Blachez, whenever she washed her hands in cold water, immediately felt an itching, which was followed by a sensation

of unendurable burning. Soon after there appeared an eruption of large, raised spots with festooned contour; the fingers became swollen to such a degree as to interfere seriously with flexion, and the feet became the seat of sensations of intolerable heat. The attack reached its maximum intensity in about a quarter of an hour and subsided in about the same length of time. The same effect was produced by contact with cold air or by the wind. Barthélemy reports a case in which similar symptoms were caused by heat.

A young girl, sixteen years of age, had a skin so sensitive that she could not be kissed without immediately having red wheals upon her face. The least scratch upon the arms or the calves (it was there at least that the phenomenon was most evident) produced the raised streaks, and the lace of her chemise and the clocks of her stockings left marks upon the skin underneath. Although most patients have no abnormal sensation, this one experienced a pruritus which compelled her to scratch. The striæ quickly appeared upon the pruriginous portions, but the skin retained its natural color if she resisted the itching and did not scratch herself. While scratching she had a feeling as if she had been pricked with a bunch of pins; then in proportion as the marks became elevated the abnormal sensation diminished and disappeared. The dermographism usually was increased and most marked at the time of menstruation, beginning a little before and continuing a little after each period, then became less intense. It was very pronounced during seven or eight months when menstrual disorders caused anæmia and nervousness; then it gradually disappeared simultaneously with the uterine disorders, and returned two or three months after under similar circumstances, to disappear completely at the end of six months (Barthélemy).

The duration of the phenomenon varies considerably. A half-hour is the rule, but it may last often two, three, or four hours; exceptionally the duration is eight, ten, twelve, or twenty-four hours. Cohn has reported a case in which the marks were still visible in the form of scratches at the end of two days.

In some patients the repetition of the phenomenon can be made indefinitely; in others it gradually becomes weaker, as if it caused a kind of nervous exhaustion or discharge of electricity. In a case observed by Féré and Lamy the exhaustion was prolonged even to the next morning.

All portions of the body are not equally liable to produce in relief the marks which are traced upon the skin. A seat of election is the thorax, either over the sternum or between the shoulders, although this region is only slightly vascular, poorly supplied with nerves and lymphatics, and not at all sensitive; but it is muscular and rests upon

a resistant base which makes it responsive to mechanical irritations. The next most common site is the abdomen, then the face, and then the upper and lower limbs, the susceptibility diminishing progressively from the trunk to the periphery. Such is the rule, but it has its exceptions. Chouppe has reported a case (Société de Biologie, séance du 21 Novembre, 1891) where the dermographism was more marked upon the face than upon the rest of the body. Lewin has reported another where it was limited to the skin of the breasts. Finally, there are numerous cases in which the phenomenon is obtained with equal intensity throughout the whole extent of the skin: on the feet, the hands, the neck, the buttock, and the face, and it is seen even upon the mucous membrane, *e.g.*, the arch of the palate, the throat, or the œsophagus, as in a rheumatic and nervous patient of Blachez.

The sensibility appears to be exactly the same where dermographic urticaria occurs as on the other parts. It may appear upon anæsthetic areas, as among hysterical subjects for example, just as well as upon hyperæsthetic portions of the integument.

This dermographic nettle rash may be considered as the type of urticaria of nervous origin. We have seen that the condition does not always appear in the form of tracings and bands in consequence of pressure, but may show itself in the form of circular or diffuse elevations caused by impressions of cold or heat.

Moreover, this nervous urticaria caused by mental emotions, errors in diet, and the like, is often accompanied by an ordinary urticaria; and on the other hand the subjects of urticaria vulgaris are always more or less autographic.

Jacquet says that without direct irritation of the skin, although the urticaria might exist in a latent form, there will not appear either pruritus or an urticarial wheal. In his opinion each urticarial element is the immediate absolute result of an external stimulus, and it is sufficient to envelop any portion of the body with a protective dressing in order to stop completely both the pruritus and the urticaria.

I have personally observed a certain number of cases which demonstrate that this assertion of Jacquet is too dogmatic. In these cases, despite a protective dressing of the best character, the sensation of pruritus still persisted, and when the dressing was removed a more or less intense urticaria was found upon the skin which had been protected.

We need not here describe the clinical characteristics of acute or chronic urticaria vulgaris, but there is one variety of urticaria of which we ought to say a few words, for it bears a certain relationship

to the acute œdemas of nervous origin. This is the affection called by Besnier and Doyon œdematous urticaria and described by Barthélemy under the name of giant urticaria, and by Hardy as tuberous or œdematous urticaria. Sometimes this condition of œdema is general, appearing especially upon the peripheral portions of the limbs and the face, but less frequently upon other portions of the cutaneous surface.

Vidal reports an interesting case of giant urticaria in which the white œdematous elevation, scarcely encircled by a thin reddish border, formed upon the skin of the abdomen a puffy oval tumor 10 cm. wide and with a long diameter of nearly 15 cm. It appeared some hours after a violent paroxysm of rage. The patient was a woman twenty-six years of age, very nervous, rheumatic, and suffering from gastralgia. The urticarial eruption, characterized by a single but unusually large lesion, appeared about five o'clock in the afternoon and had entirely disappeared by the next morning.

I have seen a case of œdematous urticaria, generalized over the head, neck, and upper and lower limbs in a young woman of twenty-four, nervous and of arthritic temperament, coming on in consequence of a violent mental emotion.

In these cases the pruritus and the characteristic urticarial spots which are found on the surface of the œdematous regions or elsewhere, and especially the phenomenon of dermographism, which one must always attempt to bring out in other portions of the skin, will clear up the diagnosis.

In other cases the œdema is localized in one eyelid, one cheek, the upper or lower lip, one ear, on the internal surface of the lips or cheeks, on the tongue, the vulva, or the prepuce.

The diagnosis will then be made by exclusion, by determining the absence of every other general or local cause of œdema, by finding out if the subject is dermographic, and by ascertaining if there is elsewhere an eruption of urticaria vulgaris, which shows itself ordinarily at the time of the disappearance of the œdema, and which is always accompanied by pruritus.

Ought we to include among the urticarias, under the name *urticaire devenu gangréneuse*, the case reported by J. Renaut, of Lyons, in 1890, or does that belong simply to the trophic disseminated gangrenes of the skin, a case of which I reported in 1881? It is very difficult to say.

In my case, [9] occurring in a girl of eighteen years, the cutaneous lesion began with a painful sensation on limited portions of the skin. There was anæsthesia at the points where the gangrene appeared later. There were many of these spots of dry gangrene. The re-

sulting ulcerations were followed by cicatrization of a cheloid character. There was no appreciable lowering of the general health. The disease had begun three years before and was treated after many different plans, but no benefit resulted from any of them.

Renaut's case [1] was one in which the urticarial lesions became gangrenous. The case was one of successive and disseminated gangrene of the skin occurring in a man twenty-two years of age. "There were gangrenous spots very superficial and of the size of a fifty-centime piece. . . . As soon as this lesion came to be rather frequently touched in the examination, the surrounding skin being more or less compressed, there arose numerous urticarial papules, at first hyperæmic, then exsanguinated in the centre and of a dull white color. Kneading of the skin at any other point caused numerous papules of typical urticaria to appear. It was found also that the patient, affected with polymorphous acne, had a skin which was soft, shining, and as if rubbed with oil, like that of the negro, readily staining cigarette paper; and finally that the patient was autographic."

Renaut described the rapidly formed anæmic, œdematous line (the classic dermographic condition), and adds that the next day a light rubbing of the skin with the palm of the hand was sufficient to cause the hyperæmic streak to reappear where it had been traced the night before. If letters, a cross, or a star had been traced, they reappeared in the same manner, at first in the form of red tracings and then in relief as urticarial markings. The patient had become as it were a stigmatic.

Renaut adds: "Where a line is traced upon the skin with the nail or a blunt pencil it is not simply a meningitic streak which appears, it is a pink ribbon which at the same time that it enlarges by its periphery becomes at its centre œdematous and urticarial. The streak traced upon the skin soon becomes raised and stands out in relief. Then the fluid imprisoned in the inelastic meshes of the derma compresses the vessels which belong to it, and the centre of the streak becomes the seat of what I have called anæmic œdema, while on each side the congestion shades off. This kind of traumatic urticaria is pruriginous and gives rise to urticarial wheals elsewhere.

"There are times when a line drawn with the nail or the end of a match causes a congestive œdema, so intense at the point touched that the abundant diapedesis results in a hemorrhage. With the white corpuscles a large number of red pass out, and when the œdema, first congestive and then anæmic, disappears, we find in place of the pink streak which had become white an ecchymotic streak. The stigmatism is thus complete. Spontaneous hemorrhage, or even gangrene, is a more advanced stage.

"We know what happens during the formation of an urticarial lesion of any kind. In the beginning, a sudden paralysis of the arterioles supplying the vascular cones of the skin leads to active congestion of the region to which the artery is distributed, whence the redness. In this area of hyperæmia the course of the blood slackens through insufficiency in the size of the efferent venules, whence results an abundant diapedesis ending in congestive œdema. The interfascicular spaces of the derma being inelastic, the œdematous fluid which is exuded under pressure accumulates with increasing tension around the vessels. When this tension has become equal to and surpasses the tension of blood in the vessels, these flatten and their lumen is effaced, whence the anæmic œdema and the exsanguinated appearance of the centre of the wheal or of the urticarial streak. In these conditions, we sometimes see the epidermis yield to the great intradermic pressure acting in every direction, and we then have the bullous urticaria which is not uncommon.

"If in cases of urticaria vulgaris the urticarial lesions were not wholly or relatively ephemeral, the anæmic œdema would have another result, viz., superficial gangrene, of rounded outline and seated in the portion of the skin near the mucous body, which portion can exist only under a constant blood-supply, as the enormous development of the capillaries in groups indicates.

"But among autographics, such as our patient, the urticarial lesions, once produced, last a very long time. In some among them, the anæmic œdema renders the centre of the papule of urticaria absolutely exsanguinated. In my subject I have several times demonstrated this by pricking with a pin the anæmic centre of the papule. Finally, as the urticaria not only disappears slowly, but returns with the least scratching or injury, we may easily understand that after some time the vitality of the superficial portions of the skin is impaired and necrosis occurs on the site of those wheals which are the most persistent, or which have been maintained by the scratching indulged in on account of the incessant pruritus of which they are the seat.

"Finally, what shows clearly that there is a close relationship between the anæmic œdema and the eschar, is that the latter corresponds exactly in size and shape to the anæmic zone of each urticarial papule destined to become gangrenous. I would add that in the genesis of the gangrenous lesions we must not lose sight of the mechanical action of scratching by dirty fingers. These naturally introduce germs which, invading the tissues that the anæmia has brought to the minimum of vitality, and which the œdema has filled with a fluid favorable for germ culture, may play a decisive part in the formation of the eschars."

In concluding this section, we would repeat that three causes must be kept in mind in considering the etiology of urticaria. The first and the principal one is the special susceptibility of the nervous system. The second is the excitation of this particularly susceptible nervous system either by direct shock (mental emotions, etc.), by reflex irritation (uterine disease, etc.), or by some form of intoxication (alimentary, medicinal, auto-intoxication, various infections). The third is traumatic irritation of the skin by some external influence, such as cold, heat, rubbing, etc.

The first two conditions are necessary to the production of the urticaria and are complementary the one to the other. The same would appear to be true of the third, but in a less absolute manner.

The subjects predisposed to an urticaria are frequently hysterical and neurasthenic, patients whose vasomotor nervous system has become particularly impressionable by the action of an intercurrent disease (auto-intoxication of gastric, hepatic, or renal origin; arthritic disease; poisoning by alcohol, ether, lead, carbonic oxide, tobacco, etc., or an acute or chronic infection such as typhoid fever, scarlatina, the eruptive fevers, septicæmia, cholera, influenza, meningitis, malaria, or leprosy).

Dermographism is seen besides in the course of various diseases of the cerebro-spinal system.

This condition of special susceptibility of the vasomotor nervous system being once established, any slight cause will then be sufficient to produce the urticaria. Sometimes it will be a strong mental emotion (repugnance, fright, anger); at others it will be a reflex irritation of gastro-intestinal or uterine origin, as in various diseases of the uterus and its adnexa or in pregnancy, or of mammary origin, as in lactation, etc.

Sometimes it will be a neuralgia of some sort (the urticarial zona of trifacial neuralgia), a paroxysm of asthma or a nervous disease. Occasionally it will be a change of diet, an alimentary or medicinal intoxication, a sero-therapeutic injection, an infectious disease, or the rupture of an hydatid cyst.

To conclude, we must note that there are cases which cannot be explained by the special idiosyncrasy of the nervous system of the subject in regard to certain articles of food or drugs which produce the eruption of urticaria.

As Barthélemy correctly stated: "In these cases, which are rather numerous, hysteria only is responsible, since the vasomotor disturbance may be instantaneous, as when we see an erythema or an urticaria at the very moment of ingestion of a strawberry or mussel, certainly before these articles of food could be digested, even before any

fermentative change could have taken place in them; since in certain cases, quite rare it is true, the thought only of taking these forms of food has been able to produce the same gastro-facial and gastro-cutaneous reflexes. In these cases, the peripheral disorder is not sufficient to explain all, and we must concede a central action, a psychic influence by auto-suggestion. A profound or sudden external suggestion or influence, an intense emotion, strong repugnance, fright, anger, etc., may be followed by similar effects."[21]

Œdematous Dermatoneuroses.

Although œdema is a phenomenon which accompanies with more or less constancy the vascular and trophic neuroses of the skin, nevertheless in certain cases the œdema constitutes the principal if not the only symptom, at least from a clinical point of view, of a modification of the nervous influence.

It is, therefore, rational to class the œdematous neuroses of the skin with the hyperæmic vasomotor neuroses and with urticaria. When the œdema persists it produces changes and proliferations of the connective tissue. When the œdema becomes hard we do not have then a pure vasomotor neurosis of the skin, but a mixed or trophic dermatoneurosis. Here, then, we may see all the degrees between the acute soft œdema of the skin and chronic semi-solid and solid œdema. Thus we see once more the intimate relations existing between the vascular and the trophic neuroses of the skin.

Thanks to the experiments of Ranvier, Vulpian, and Boddaert, the influence of the nervous system in the formation of the œdema is to-day well established.

Ranvier has shown that ligature of the vena cava is not followed by œdema of the lower limbs if the nerve filaments which surround it are respected. Œdema is not produced by ligature of the sciatic vein, unless we also divide the sciatic nerve.

Boddaert has demonstrated that ligature of the jugular veins does not produce œdema of the neck unless the cervical sympathetic is also ligated or divided.

These experiments have determined without doubt the influence of the vasomotor system in the production of acute œdema of the skin. Besides, clinical facts have for a long time proved that œdema of the skin is seen frequently in the course and in consequence of acute or chronic disease of the nervous system.

Longet ("Traité de Physiologie") relates a case seen by Herbert Mayo, in which a lesion of the trigeminus had produced a marked œdema of all the corresponding half of the face, and at the same time

an anæsthesia of this region and an ulceration of the cornea on the same side.

As Vulpian has said: "It is not very uncommon to see an œdema develop in some part of the body in consequence of an injury of the nerves of this part. The thesis of Mongeot contains several examples of œdema from this cause. This œdema was probably in some of these cases of an inflammatory nature.

"These cases can be compared to certain results obtained by experimental section of the nerves. It is known, in fact, that section of the sciatic nerve in animals may cause an œdema of the peripheral portion of the corresponding limb. We have seen also that section of the pneumogastric causes a pulmonary œdema. In the pathological as well as in the experimental cases it is probable that the weakening of the trophic influence of the nervous centres upon the parts whose nerves have been cut plays a certain part in the production of the œdema. These parts become then more vulnerable; external irritations which in a normal state have no effect upon the processes of nutrition, may then affect them injuriously, and give rise to a subinflammatory irritation, having as a result a more or less considerable œdematous infiltration of the parts which are the seat of the irritation.

"The œdema which is produced by a wound of the nerves sometimes shows itself solely in the parts to which the injured nerve is distributed—there is, at least apparently, a direct œdema. This was observed in a case under the care of J. Roux. In this case a phlebotomy had been performed upon the right arm and there probably was a prick of the radial nerve. A severe pain was felt in the thumb, the index finger, and the radial border of the middle finger; after a short time the pain was accompanied by an œdema which did not involve any portion of the hand except the fingers which were the seat of the pain."[28]

Œdema has quite frequently been seen in the course of a neuralgia, particularly a facial neuralgia. I have seen a case of intense facial neuralgia of malarial origin, occurring in a subject whose teeth were absolutely sound (in this case an inflammatory origin of the œdema could not therefore be admitted), accompanied by a pronounced œdema of the face and of the buccal mucous membrane of the side corresponding to the neuralgia. This intermittent neuralgia occurred about once a fortnight and lasted for several days. The œdema appeared soon after the neuralgia and remained three or four days after the latter had disappeared. Both the œdema and the neuralgia were finally controlled by prolonged treatment with quinine and arsenic.

Œdema has been seen accompanying neuritis in the upper and lower extremities. I myself have seen several examples. In a

patient suffering from an intense neuralgia of the testicle, the scrotum, and the penis, I once saw a marked œdema of the penis, and particularly the prepuce, coming on about ten days after the beginning of the neuralgia, the cause of which was not very clear, though perhaps it was a peripheral neuritis due to alcohol. No eruption of herpes occurred during the course of the neuralgia and œdema, which lasted nearly two months and finally yielded to treatment by iodide of potassium and arsenic combined with the employment of the constant current.

It is possible that in certain cases peripheral neuritis may be the cause of a local œdema. It is possible also that some so-called rheumatic œdemas are dependent upon peripheral neuritis—neuritis characterized, from a clinical point of view, by pain along the course of the nerve, symptoms which represent the prodromal period of the œdema. In some of these cases we may locate the neuritic starting-point for the œdema.

Chuffart has related, in his thesis upon the rheumatoid affections of the subcutaneous connective tissue, a case in which a slight œdema appeared along the course of the ulnar nerve at the same time that the latter became painful. Some days later the left sciatic of this same patient became painful, and this was followed by a soft œdematous swelling of the limb on that side. In other cases the œdema seems to be reflex in character, appearing in parts which are not in direct relation with the affected nerves. One case reported by Hamilton was of this nature. In this case a wound of the thumb was followed by an œdema of the palm and back of the hand. A most remarkable case is that of the woman mentioned by Potain, who was suffering at the same time from œdema of the lower limbs and an ulceration of the cervix uteri. The cure of the ulceration was followed by the disappearance of the œdema.

Of the same nature perhaps as Potain's case are those of œdema of the face and false erysipelas recurring at each menstrual period.

Œdema has been seen as a consequence of cerebral lesions.* The œdema is sometimes precocious and appears on the surface of the hemiplegic limbs within a few days after the apoplexy; in others it appears only at the end of several weeks. It varies also in intensity.

In the paraplegia produced by lesions of the medulla or by compression of this nervous centre it is not uncommon to see œdema of the lower limbs. Mayet has called attention to acute œdema following a fracture of the vertebral column. Balmer has seen it come

* See article by Thomas Laycock in the Lancet, 1875.

on during the course of an infantile paralysis. Remack and Roth have described an indolent œdema occurring in syringomyelia accompanied by a more or less deep violet or reddish color of the skin and by a lowering of the temperature. This œdema is found more especially upon the backs of the hands which are then analgetic and thermoanæsthetic. Œdema has been observed among sufferers from tabes.

Sydenham long ago called attention to the appearance of an œdematous eruption in hysterical subjects, situated by preference on the lower limbs, appearing especially in the morning, and not pitting on pressure. At first sight it resembles ordinary œdema, being white and hard.

Charcot has noted the occurrence in hysterical patients of another kind of œdema, which he has described under the name of the blue œdema of hysteria, and which is characterized by a lowering of the local temperature sometimes 2°, 3°, or even 5° C., by the absence of pitting on pressure, and by a purplish color of the skin, sometimes very deep, even almost black, which may remain even after the disappearance of the œdema. Almost always sensations of distention and more or less acute pain are present.

This œdema may be associated with disorders of sensibility, either hyperæsthesia or anæsthesia. It is very tenacious, but is subject to the most sudden changes under some influence or other, such as menstruation or the emotions. The duration, sometimes long, is subordinate to the progress of the paralysis and the contracture with which it is frequently associated.

Pospelow, of Moscow, has related the history of a dermographic patient who could not wash, or rather dry herself with a towel, without her face becoming white and œdematous, this being followed by a lively sensation of burning as the normal redness returned to the skin.

The acute circumscribed œdema of Quincke and Jamieson, or angioneurotic œdema, presents very great analogy to giant urticaria as we have already remarked above. This disease begins suddenly, and usually simultaneously at several points of the body. It produces localized œdematous swellings which, however, are not so strictly defined as the wheals of urticaria. These swellings, which may be the size of the palm of the hand, increase in size for several hours and then completely disappear in a short time. The color of the skin over them is scarcely changed, although it is sometimes a little more red, sometimes a little paler than in the normal condition.

The affection appears ordinarily upon the lips, the cheeks, the eyelids, the mucous membrane of the mouth, the pharynx, and the larynx, and upon the limbs. It may be accompanied by digestive disorders, vomiting and diarrhœa, such as we see in urticaria of the

mucous surfaces. Max Joseph has seen paroxysmal hemoglobinuria associated with this affection. The subjective symptoms are not well marked; the patients complain only of heat and itching and a sense of tension. When the disease involves the pharyngo-laryngeal mucous membrane they complain of difficulty of deglutition and of dyspnœa.

It occurs in successive attacks through a series of years. It is met with ordinarily among nervous persons, and in certain cases it has been proven to be hereditary. The impression of cold, mental emotions, the abuse of alcoholic drinks, rheumatic affections, and menstrual disorders play an important part in its etiology.

Hysterical Breast.

Although the œdema which constitutes one of the symptoms of hysterical breast is often a hard œdema, yet as it may present itself under the acute form, to avoid repetition we will take it up here.

Gilles de la Tourette[1] has recently described a variety of hysterical œdema located in the breasts of women, an affection which interests both physicians and surgeons. The hysterical breast has in fact led to a number of errors in diagnosis; surgeons have often performed ablation of the organ for an affection which nevertheless was amenable to medical treatment alone. This is one of the most typical examples of the local hysterias described by Brodie.

The first case seems to have been described by Willis in 1678. A young girl of sixteen was attacked by hysterical symptoms following a contusion of the breast. The swelling and pain which she felt always coincided with the hysterical attacks. The affection was cured by pregnancy at the same time that the convulsive attacks disappeared. Frederic Hoffmann has reported a case of painful swelling of both breasts coincident with hysterical attacks. One of the patients had at the same time a bloody sweat and hysterical angina pectoris.

The most interesting of the relations of the older authors in regard to the hysterical breast are found in the book of Carré de Montgeron, devoted to the description of the miracles which occurred at the tomb of the deacon Pâris.

Two cases, those of Mlle. Coirin and Anne Augier, are especially interesting, the œdema having been accompanied by ulcerations of the nipple so that both cases were believed to be cancer. The marvellous cure attributed to the miraculous power of the earth taken from the grave of the deacon Pâris is explained by the hysterical nature of the affection. Gilles de la Tourette has made a critical review of these cases. The account of the first of them might be put into medical language as follows:

Syncopal attacks of hysteria originally excited by traumatism; blue œdema of the left breast, sufficiently intense to produce gangrene of the skin limited to the nipple; secondary infection of the resulting wound and suppuration which caused an enlargement of the axillary glands; paralytic symptoms accompanied by atrophy of the muscles; sudden cure of the paralysis and subsequently of the atrophy; disappearance of the œdema and healing of the ulceration by a cheloid cicatrix resembling the nipple which had been destroyed by the gangrene. Such are the elements of this interesting case in which the symptoms of hysterical breast persisted for twelve years, and in which the diagnosis of cancer had been made in the beginning of the disease and amputation proposed. At the end of the last century, P. Pomme sketched some of the clinical features of hysterical breast. Following him Watson and Astley Cooper reported some cases. But Brodie was the first to give a complete description and to point out the errors of diagnosis which this affection may cause. Nevertheless, he excludes from the category of hysterical cases those in which a tumor in the breast is present. Landouzy and Briquet cite cases in confirmation of Brodie's description.

More recently cases studied in detail have been reported by Liouville, Bourneville and Regnard, Fabre, Féré, Fowler, and others.

Finally, in 1893, Gilles de la Tourette presented at the Seventh French Surgical Congress a complete exposition of the subject, calling attention also to the tumors of the mamma of hysterical origin which often accompany œdema of that organ. A local traumatism is quite frequently spoken of in the etiology of this affection as the starting-point of the dystrophic manifestation. It occurs generally among women suffering from disorders of menstruation. There has never been recorded a case occurring in a man. Usually only one breast is affected. Yet F. Hoffmann, Liouville, and Gilles de la Tourette have reported cases where both breasts were the seat of this disease.

For a description of the hysterical breast we can do no better than to quote the very complete one which Gilles de la Tourette presents.

"In its entirety the hysterical affection of the breast consists in a temporary or permanent increase in size of the organ with considerable hyperæsthesia of the skin covering it. There exists a hyperæsthetic, hysterogenic zone whose exaltation, brought about by various causes, produces in all these cases a convulsive paroxysm with an aura proceeding from the breast. At the time of the paroxysm a series of local vasomotor phenomena appear, varying from simple congestion to œdema and sometimes gangrene of the skin. The hy-

peræsthesia of the skin of the breast, noted in all cases, does not differ from hyperæsthesia of the integument in other parts of the body. It is much more marked under the influence of light superficial friction than of deep pressure made over a wide extent. It is sometimes so exquisite that the patient cannot endure the touch of the chemise, while in certain cases, but not in all, the pressure of the corset seems to relieve the painful symptoms. Some patients, on the other hand, are obliged to give up this support to the breasts. The hyperæsthesia is always present, but it increases at certain times under the influence of the causes which control the exaltation of the hyperæsthetic zones, which then become hysterogenic zones. Direct pressure or strong emotions may set the zone of the breast in action, and it also is influenced by the excitation of zones in the neighborhood or of those which, situated in the vagina or uterus, are exalted at the menstrual period.

"When by the action of these various causes the mammary zone is aroused, one or both breasts become spontaneously the seat of prickings and dartings, sometimes very painful and of a neuralgic character. The breast swells, the nipple becomes erect, and the whole organ increases to perhaps double its normal size.

"Often the pain does not remain localized. Besides the phenomenon of the aura, such as sensations of strangling, strange feelings in the head, etc., the pains radiate, as Brodie has seen, from the axilla and from the spine, uniting with the painful phenomena originating in other zones in the vicinity, which become excited independently. Thus it may be accompanied by hysterical angina pectoris. When the swelling of the breast has reached its maximum the paroxysm bursts forth, either as a rhythmical chorea, as was noted by Brodie, or as an ordinary hysterical seizure. Nevertheless the pain which accompanies the swelling of the mamma dominates the paroxysm and gives it a peculiar character.

"It is not necessary that the convulsive paroxysm should be associated with an exaltation of the mammary hysterogenic zone; yet it is very rare not to find some premonitory or determining symptoms of the attack when the swelling of the breast reaches its height."

What at this time is the appearance of the skin which covers the enlarged mamma? The opinions on this point are apparently most contradictory. Brodie says there is no redness of the skin, but rather it is a little paler and smoother in appearance. Liouville states that the breasts are swollen and increased in size about one-third. The skin is hot, red, and tender. Féré expresses the same opinion. He examined a lady forty-five years of age who had become hysterical at the menopause, in consequence of some family trouble, and who pre-

sented certain mammary symptoms. At the beginning of the examination the breasts were perfectly symmetrical and without any change of color in the skin. The person who accompanied the patient said something very unkind to her, and under this influence at the same time that the patient blushed, the left breast, which was the seat of the trouble, became marbled over with small red spots like a scarlatiniform erythema; these spots quickly coalesced, forming a uniform redness which spread out a little on all sides beyond the limits of the mamma without, however, following the course of the nerves. At the same time that this redness appeared the breast became swollen *en masse* and the nipple was erect. All the region about became the seat of a sensation of smarting with pricking of the skin and dartings in the mammary gland, which felt heavy. In less than a minute all these symptoms reached their height.

The tumefaction and the other symptoms which we have just described do not always correspond to the duration of the paroxysm. In the simple cases or where the affection is very recent, the swelling disappears with the pain; but more often, especially if the paroxysms are close together, the swelling remains in varying degrees in the intervals, always accompanied by this exquisite cutaneous hyperæsthesia, which is increased under the influence of various causes.

In these cases palpation reveals some interesting peculiarities. During the paroxysm it is almost impossible to palpate the breast. The pain which it causes is then much too great to make the examination of any value. But it is not so during the intervals of the paroxysms, especially if care is taken to palpate the gland deeply and not superficially since the cutaneous excitability, always renders the examination very difficult, being capable of producing an exaltation of the hysterogenic zone.

In the examination under these conditions it will be possible sometimes to determine the existence in the breast of one or two tumors, not generally larger than a pullet's egg, which are themselves painful—a fact which can be easily ascertained after eliminating the hyperæsthesia of the integument.

In seven hysterical patients Fowler determined the presence of one or two tumors of the breast accompanied by painful symptoms. In six cases out of the seven the tumor was movable upon the underlying tissue; sometimes the lacteal ducts in the vicinity of the tumor were tender and hard. The glands in the axilla were not enlarged. Several of his patients consulted very celebrated surgeons and ablation of the gland was always advised. Yet they all recovered by a treatment into which the psychic element entered largely.

The affection is of long duration, and obstinate as are all condi-

tions of like nature. It is, furthermore, almost always prolonged by defective treatment, local applications of various kinds and elastic compression, which only serve to increase the evil.

In conclusion, hysterical breast is a distinct affection which is under the control of a hypersæsthetic hysterogenic zone of the skin of the mammary region, and accompanied by an œdema of the connective tissue of the gland, which may have the appearance of white, pink, or purple œdema.

Besides this form, where the swelling of the breast is uniform, there is another susceptible of the same interpretation. In this the œdema, which in all cases is hard, and does not pit on pressure, is circumscribed and has the appearance of a tumor, but is not accompanied by glandular enlargement, at least unless there is ulceration.

Diagnosis.—The preceding description gives at the same time a summary of all the symptoms and the essential elements of diagnosis. This will be confirmed by the discovery of other signs of hysteria which rarely fail. We cannot sufficiently insist upon the importance of never neglecting to make a search of this kind in a case of tumor of the breast. In this way an intervention which is useless or dangerous may be avoided.

The diagnosis may be rendered more difficult by the presence of ulcerations. These may be the result of topical irritants unfortunately applied to the affected breast, or they may represent an extreme degree of trophic disturbance in the mamma. Here again the search for stigmata of hysteria, the examination of the condition of sensation, and the progress of the disease will give warning of the true nature of the ulcerated tumor.

The *prognosis* of the hysterical affection of the mamma is quite grave. The trouble may last for many years; the ulcerations and gangrenous phenomena seen in some cases may be the source of secondary infection more serious still.

It is against the latter that we ought to direct the local *treatment;* but the general treatment addressed to the neurosis, which is the primary cause of hysterical affection of the breast, is of most importance and should engage especially the attention of the physician.

TROPHIC DERMATONEUROSES OR CUTANEOUS TROPHONEUROSES.

After what we said at the beginning of this article we may enter at once upon the study of the trophic dermatoneuroses. The cutaneous trophoneuroses, properly so called, may appear under very

different aspects. To them belong a large number of changes in the surface of the skin, changes which are eruptive or non-eruptive in character. Many and varied are the eruptions by which changes in the central or peripheral nervous system, and disorders of its trophic function, may be manifested upon the skin. The table of the trophic dermatoneuroses which, however, we shall not follow strictly in our description, has been given in the introductory section.

Chronic Trophoneurotic Erythema.

This group of erythemata and chronic trophoneurotic inflammations constitutes an important chapter in the study of the trophoneurotic inflammatory affections. But it is at the same time a most difficult chapter to write on account of its poorly defined limits.

In fact the chronic trophoneurotic erythemata constitute most frequently the initial and transitory stage of a number of the trophoneuroses, and it is uncommon to see them retain permanently their individuality.

On the other hand, as we have already said several times, it is often difficult to determine where the vascular dermatoneurosis stops and the erythematous trophoneurosis begins. There undoubtedly exist between these two conditions, viz., simple erythema and dermatitis, all degrees of transition, just as there is found a whole series of gradations between simple œdema and hard œdema or an elephantiac condition of the skin.

However that may be, the thing which characterizes these trophoneurotic erythemata and distinguishes them from the erythematous dermatoneuroses previously studied is their tenacity, their chronicity, and the fact that they are always accompanied by a certain amount of inflammation, however slight this may be.

Accompanying Diseases.

These erythemata are seen at the beginning of a number of trophoneurotic diseases of the skin. They quite frequently follow more or less transitory forms. They are accompanied rather often by the phenomena of exudation resulting in the formation of phlyctenæ or vesicles, in hemorrhages, etc., as in polymorphous erythema. They are seen in the course of various diseases of the central nervous system (brain and spinal cord) cases of which have been reported by Vulpian, Charcot, Brown-Séquard, Friedreich, Déjerine, and others. It is well to recall that the sloughs of acute decubitus, of spinal or cerebral origin, are often preceded by chronic erythema. These ery-

themata are observed also as a consequence of lesions of the peripheral nerves. Hayem has published records of a number of cases of chronic persistent erythema consecutive to section of the peripheral nerves. Tédenat, Germain, and Arnozan have published similar cases following nervous affections secondary to chilblains. These chronic erythemata often precede or accompany the trophic changes in the central or peripheral nervous system.

Glossy Skin.

Glossy skin constitutes a classic type of trophoneurotic erythematous dermatitis.

Described first by Alexander Denmark in a case of wound of the radial nerve, it has been particularly well studied by Paget, and Mitchell, Morehouse, and Keen. The latter studied it principally as it occurred in consequence of traumatic lesions of the peripheral nerves, and particularly the incomplete lesions or crushing of the nerves, such as were seen among the wounded in the war of the American rebellion.

In the beginning the skin is smooth and shining, and presents a diffuse or mottled pink or red color. Often it appears as if varnished and so tense that its folds and ridges disappear. This phenomenon is very remarkable especially upon the surface of the extremities, where the disease appears most frequently and where it has often been mistaken for chilblains.

Then as Weir Mitchell writes[1]:

"The skin affected in these cases was deep red or mottled, or red and pale in patches. The epithelium appeared to have been partially lost, so that the cutis was exposed in places. The subcuticular tissues were nearly always shrunken, and where the palm alone was attacked, the part so diseased seemed to be a little depressed and firmer, and less elastic than common. In the fingers there were often cracks in the altered skin, and the integuments presented the appearance of being tightly drawn over the subjacent tissues. The surface of all the affected parts was glossy, and shining as though it had been skilfully varnished. Nothing more curious than these red and shining tissues can be conceived of. In most of them the part was devoid of wrinkles and perfectly free from hair. Mr. Paget's comparison of chilblains is one which we often used to describe these appearances; but in some instances we have been more strikingly reminded of the characters of certain large, thin, and highly polished scars.

"Where a single nerve, as the ulnar, has been attacked, the described state of skin was seen only in its ultimate distribution; but

in other instances of more extensive nerve injury, the central palm suffered, or a single finger, or the pulps of all of them. In others the palm or fingers were dotted with islets of thin and red and glossy skin. The dorsum of the hand, as a rule, was in that member the part least subject to the alteration, while the dorsum of the foot was in that region the part most liable to suffer. Will the greater functional endowments of the palm of the hand, as compared to the sole of the foot, account for this preference?"

After a time there occurs a thinning of the skin in consequence of the cellular atrophy. This atrophy is usually accompanied by that of the muscles as well. The disease most frequently involves the extremities, and after a certain time there are produced changes in the nails, which may finally fall off.

The glands of the skin likewise disappear at last and the fingers have a drawn-out appearance which is very remarkable. Glossy skin is usually associated with violent neuralgic pains, and Denmark, Paget, and Mitchell, Morehouse, and Keen have all called attention to this fact. Weir Mitchell in particular emphasizes the sensation of sharp pain which the patients experience on the affected parts, a kind of neuralgia appearing before all other symptoms and enabling us to predict with certainty the eruption of the skin. Not only does pain exist upon the surface of the extremities, *i.e.*, the hands and feet, but in the majority of cases this affection of the fingers is accompanied by a particular neuralgia involving the whole limb.

According to Weir Mitchell this disease has never appeared before the second week after the lesion of the nerve. It ordinarily precedes the cure of the wound and it quite often coincides with the occurrence of inflammatory symptoms.

The duration of the disease varies from some weeks to years. In all the cases which Weir Mitchell had an opportunity to follow up there was a cure or gradual disappearance.

Acrodynic Erythema.

Acrodynic erythema characterized by erythematous spots, situated most frequently upon the palms of the hands and the soles of the feet, accompanied sometimes by swelling, ecchymoses, cyanosis, and even partial gangrene, by brownish coloration of the skin of the abdomen, the neck, and the articular folds, and by œdema of the face, should be considered as a dermatoneurosis resulting from a toxic cause acting upon the nervous system and particularly the spinal cord.

In cases of acrodynia, in fact, the nervous symptoms are most remarkable for their constancy and the multiplicity of their mani-

festations—numbness, pricking, and tingling, and often also lancinating pains, which are felt in the hands and feet, especially the latter. Cutaneous and muscular hyperæsthesia with sensations of intolerable heat were often so extreme that the least contact, the lightest touch, could not be endured. In some patients there was, on the other hand, an anæsthesia of such nature that several lost their shoes without perceiving that they were walking with bare feet. Some of them felt twitching of tendons, cramps, and spasms; in others there was a painful contracture of the muscles of the extremities—a sort of tetany.

In Belgium, Tosquinet and Camberlin have noted changes in the cord and its membranes in twelve subjects who died in the prisons of St. Bernard and Namur.

As Vidal wrote in 1864, the cutaneous manifestions of both pellagra and acrodynia appear to be dependent upon changes in the nervous system. I refer the reader for more details to the article Acrodynia in the work above referred to."

Closely related to pellagrous and acrodynic erythema are the pellagroid erythemata occurring among alcoholic and cachectic subjects which have been described especially by Hardy in a paper read before the Académie de Médecine.

Vesicular Eruptions.

Herpes and Herpes Zoster.

Zona, or herpes zoster, which was for a long time regarded as a form of exanthem and classed along with the erysipelatous affections, really constitutes one of the types of dermatosis of nervous origin. The demonstration of this fact has had most important clinical and pathological consequences, for it was this which in part directed attention to the cutaneous affections of nervous origin. To Parrot belongs the credit of having suggested, in an excellent clinical study of the disease, the nervous origin of zona, but it was through the labors of pathologists that this fact was incontestably established. The first observation of zona in which the nervous lesions were noted was published in 1861 by Danielsen; the second was by Esmarch. But it is to Baerensprung and to Charcot that we owe the actual pathological demonstration of the nervous origin of the affection. In 1868 Baerensprung, in a revision of his memoir of 1861, published in detail the anatomico-pathological findings in a case of intercostal zona, the autopsy on which was made by v. Recklinghausen. In 1865 Charcot and Cotard reported to the Société de Biologie a case

of zona of the neck secondary to cancer of the spine. A microscopical examination, made with the greatest care, showed the presence of very marked lesions in the spinal ganglia and cervical nerves. These clinical and anatomical facts were confirmed by the observations of Axenfeld, Romberg, Rouget, Ollivier, Wagner, Raynaud, Verneuil, Hutchinson, Brown-Séquard, Weidner, Sattler, Kaposi, and others. The nervous origin of ophthalmic zoster has been demonstrated by O. Wyss, Horner, Hybord, and others.

We thus see that the nervous origin of this affection, at least in the majority of cases, has been incontestably proven, yet there are many gaps in our knowledge of the disease that remain to be filled, and many investigations into the nature of the affection are yet needed. While the lesion of the nervous ganglia has been discovered in the great majority of cases, our knowledge concerning the condition of the peripheral nerves in zona is still very incomplete and calls for fresh study. The examination of the peripheral nerves is of very great importance, for we can no longer maintain with Baerensprung that zona depends always upon a lesion of the spinal ganglia. Indeed, the following considerations forbid us to admit the correctness of that conclusion: Cases of zona following lesions of the peripheral nerves are not rare; we have reports of a large number of instances in which zona occurred in the course of disease of the spinal cord, especially of central myelitis and of tabes, and up to the present time the ganglia have always been found to be unaffected in this last-named disease. And again, how can we explain on Baerensprung's hypothesis the motor troubles, such as paresis and muscular atrophy, sometimes very persistent, which occur subsequent to certain cases of zona? How also can we explain the cases of double zona, a certain number of cases of which have been reported in the literature? Finally we have reports of autopsies in cases of zona in which it was impossible to discover any changes in the spinal ganglion (Weidner, Kaposi, and others).

There is one surprising fact, which demands new researches for its elucidation. How can we explain the fact that, in cases of zona in which lesions of the spinal ganglia were found and were regarded as the cause of the affection, the posterior spinal roots were healthy —a fact which seems to be completely at variance with the Wallerian theory? How also can we explain those cases in which the intercostal nerves, coming from the affected spinal ganglia, were sound, or at least in which the nerve trunks containing them appeared so to be? While the results of the examinations of the nerves in most of these cases must be accepted with reserve, since they were made before the employment of osmic acid, yet there have been some researches

made according to modern methods by such a skilful histologist as Chandelux working under the direction of Renaut, in which the same fact was observed. We must admit, however, that Chandelux does not assert positively that the nerve trunks were sound. We see, therefore, the necessity of new investigation before we can affirm with absolute certainty the existence of facts in contravention to the Wallerian theory.

We believe then that it is incorrect to attribute greater importance to lesions of the spinal ganglia than to those of the peripheral nerves in the pathogenesis of zona. This is also the view held by Pitres and Vaillard,[1a] who report two very convincing cases, and who admit also that changes in the nerves are probably more important and more constant than are lesions of the spinal ganglia in the pathogenesis of zona.

In fine, it appears to be well established that zona is almost always, if not always, a cutaneous affection of trophic origin and that it may occur as a consequence of various lesions of the nervous system. It is rare in cerebral affections, although such cases have been reported by Charcot, Oppolzer, Duncan, Payne, Hesselinck, and Chvostek. It occurs much more frequently in the course of diseases of the spinal cord, especially locomotor ataxia (Charcot, Vulpian, Liouville, and many others). It is a curious fact, and one which at first sight appears to be in contradiction to what we know concerning the physiology of the cord, that it has been observed in the course of subacute spinal paralysis (Charcot). Zona of peripheral origin, following a lesion of the spinal ganglia (Baerensprung, Charcot) or of the peripheral nerves (Danielsen, Charcot, Esmarch, Verneuil, Rouget, Leudet, and others), or even one affecting solely the posterior spinal roots between the cord and the ganglion (Weidner), is of very frequent occurrence.

Ought we to go still further, following Baerensprung, and include the other forms of herpes along with zona among the trophic affections? May we, following Gerhardt, regard herpes labialis as due to compression of the branches of the trigeminus by dilated blood-vessels within the bony canals during a febrile attack? The tendency at the present time is to admit the nervous origin of herpes in general, and the works of Mauriac, Mourson, Leudet, Fernet, Barth, Auspitz, Schwimmer, Herzog, Bruneau, Verneuil, Merklen, and others incline to the defence of this view. The theory is at first sight seductive, but we need further anatomical and pathological researches before it can be accepted as a fact. In this connection it seems to me opportune to recall the observation published by Verneuil of a chronic preputial herpes cured by circumcision, in which microscop-

ical examination demonstrated the presence of plexiform cylindrical neuromata of the terminal nerve filaments.

Eczema.

We find in the literature very many reports of cases of eczema following lesions of the peripheral nerves. Weir Mitchell says that he has often seen eczema after wounds of the nerves, and he maintains that it was actually eczema and not herpes as Hanfield-Jones and Charcot had suggested it might be. Dumesnil has reported cases of eczema which he regarded as consecutive to peripheral neuritis from carbonic-oxide poisoning. Eczematous eruptions are frequent in patients suffering from perforating ulcer (Duplay and Morat). Duplay has noted the occurrence of eczematous eruptions secondary to traumatic neuritis after amputation. Tédenat describes as a frequent complication of old frost bites attacks of obstinate eczema which he regards as dependent upon changes in the peripheral nervous system. Arnozan reports in his thesis an important observation of eczema of peripheral nervous origin which was related to him by Brouardel. C. Fox has noted in a number of instances an eczematous eruption following most distinctly the course of the nerves. Attacks of eczema following neuralgia have been reported by Eulenburg, Lailler, and others, and Vulpian, Lewin, Eulenburg, and Purdon have noted their occurrence in patients suffering from spinal-cord troubles, especially tabes. Attacks of eczema sometimes alternate in a remarkable manner with migraine and other nervous symptoms; my thesis of 1881 contains several observations of that nature. The influence of the emotions in the production of eczema has long been recognized. Finally we may note the frequent coincidence of eczema with other cutaneous affections of manifestly nervous origin, such as zona and pemphigus, with neuralgia, asthma (Blachez), and with anæsthesia as observed by Rendu in eczema of internal origin.

Such facts afford a presumption in favor of the nervous origin of certain forms of eczema, and as long ago as 1870 Tilbury Fox admitted it and was later seconded by Lewin, Bulkley, Schwimmer, and others. To the Italian pathologists belongs the credit of having first made researches into this question. In 1878 Marcacci published an observation of lesions of the sympathetic ganglia in a case of acute generalized eczema. The histological examination and the technique employed were, however, insufficient to warrant us in accepting in his case an absolute relation of cause and effect between the lesions of the sympathetic ganglia and the cutaneous affection. In 1879 Colomiatti published a paper on the alterations of the cutaneous

nerves in eczema. This skilful histologist claimed to have found very distinct parenchymatous neuritis in both acute and chronic eczema. I have examined into the condition of the cutaneous nerves in two cases of eczema, but in these the nerve trunks were normal. But, despite these negative results, I am far from doubting the positive facts so clearly established by Colomiatti. I believe that we have simply to do with eczemata of different origin, for diverse causes may produce like results. Indeed, in two cases of eczema examined subsequently, I found evident lesions of the cutaneous nerves. These were cases of symmetrical and recurrent eczema of the extremities, occurring in patients who presented in marked degree the signs of herpetism described by Bazin and Hardy and more recently by Lancereaux. The nervous origin of certain forms of eczema seems, therefore, to be demonstrated by both clinical observations and anatomical findings.

Bullous Eruptions.

Pemphigus.

Various clinical facts afford a presumption of the nervous origin of pemphigus, and numerous cases have been reported by Gilibert, Paget, Charcot, Weir Mitchell, Porson, Hayem, Richelot, Earl, Wigglesworth, Lander, Bibber, Leudet, and others, and also by myself in my thesis of 1881, which show that peripheral nerve lesions are quite frequently accompanied by bullous eruptions. Brown-Séquard, Charcot, Vulpian, Dujardin-Beaumetz, Gaillard, Mayet, Chvostek, and others have reported a fairly large number of cases of pemphigus occurring as a complication of acute or chronic myelitis or meningomyelitis. We sometimes see pemphigoid eruptions following brain lesions, *e.g.*, the cases of pemphigus occurring in hemiplegics, reported by Romberg, Hesselinck, Eulenburg, Rendu, Chvostek, Brissaud, and others, and in sufferers from general paralysis, reported by Déjerine, Leloir, Fèvre, and others. Sometimes pemphigoid eruptions occur in the course of various other affections of the nervous system, such as the neuroses and insanity. Frank, Martius, Schulze, Gignon, Landgraf, Pick, and Hebra have reported a number of important cases pointing to the nervous origin of so-called hysterical pemphigus. Fèvre says that he has seen a case of pemphigus associated with insanity. Jehn speaks of the formation of numerous bullæ on the dorsal surface of the hands and feet in a case of acute mania, accompanied by anæsthesia and vasomotor troubles, which terminated fatally. It would be easy to multiply clinical facts of this nature. I will only add that it has been urged in favor of the

nervous origin of pemphigus that the affection occurs in connection with acrodynia (Miramont, Hervez de Chégoin), pellagra (Roussel), leprosy (the leprous pemphigus of Danielsen and Boeck and of Neumann); that acute decubitus is frequently accompanied by bullæ, and that pemphigus may greatly resemble zoster. Moërs saw a case of zoster transformed into pemphigus in a child of fourteen years. Finally we may note the symmetry so frequently observed in pemphigus, the profound alterations in cutaneous sensibility, especially in pemphigus with small lesions, and the ocular ulcers which recall in a striking manner those met with in elephantiasis Græcorum (White, Cooper, Wecker, Hardy). In his mémoire of 1883 Schwimmer, who concedes entirely the nervous origin of pemphigus (as Auspitz also appears to do), has reported a case of nervous pemphigus entitled "Traumatic axillo-brachial zoster, generalized pemphigus, paraplegia, death." I have seen with Professor Hallez, of Lille, a remarkable case of generalized pemphigus, followed by death, in which the appearance of each crop of bullæ was preceded by intense neuralgic pains.

The various clinical facts here recounted afford a strong presumption in favor of the nervous origin of pemphigus, and this view is supported by the results of the anatomical study of the disease. Déjerine published in 1876, in the *Archives de Physiologie*, a case entitled, "General paralysis, trophic cutaneous troubles, pemphigus, lesions of the spinal cord and of the peripheral nerve terminations, parenchymatous neuritis of the cutaneous nerves." The conclusions which Déjerine formulated from the study of this case were confirmed in 1880 by Jarisch, who found, at the autopsy of a woman affected with a cutaneous trouble very like acute pemphigus (herpes iris of Hebra), a profound alteration of the gray substance of the cord. In my treatise of 1881 (Obs. XV.) I was enabled through the kindness of Quinquaud to report a case of dorsal myelitis, hemiparaplegia, bullous eruption along the course of the intercostal nerves, parenchymatous neuritis of the peripheral nerves. We thus see that the nervous origin of acute pemphigus has been demonstrated, in certain cases at least.

As regards chronic pemphigus, the nervous origin of which may be assumed on the strength of the same evidence as in the case of the acute affection, I think that I have demonstrated it anatomically. In a note presented to the Société de Biologie in collaboration with my friend Brocq, I described some most evident changes in the peripheral nerves in a case of chronic pemphigus occurring in the service of Vidal. Since then I have had occasion to examine another case of chronic pemphigus, also in Vidal's service, and to demonstrate again lesions of the cutaneous nerves, posterior spinal roots, and cord.

The results of my researches into the nature of chronic pemphigus have been confirmed by Schwimmer, who in collaboration with Babes found well-marked lesions of the cord and posterior roots in two cases of pemphigus; these two cases are described in his book under the titles respectively of "Hemorrhagic pemphigus vulgaris, colliquative diarrhœa, death," and "Pemphigus foliaceus, ascending myelitis, death."

A case of De Amicis has shown how important from a therapeutic point of view may be a knowledge of the nervous origin of certain forms of pemphigus.

Exfoliative Dermatitis.

The researches of Quinquaud, communicated to the Anatomical Society of Paris in 1879, seem to show that lesions of the central and peripheral nervous system play a very important rôle in the pathogenesis of exfoliative dermatitis, under which name is understood an independent affection, Erasmus Wilson's disease, well studied by Brocq in a noteworthy monograph. It is not certain, however, whether the primary severe acute dermatitis of Quinquaud is really the same disease as the exfoliative dermatitis of Erasmus Wilson and Vidal, although the arguments offered by Brocq render it quite probable. However this may be, the researches of Quinquaud, in connection with which we may recall the observations of Lancereaux, Hutchinson, Baxter, and Jamieson, show that different forms of dermatitis with exfoliation, related to pemphigus foliaceus of Hardy, are closely connected with changes in the central or peripheral nervous system.

Pustular Eruptions.

Ecthyma.

Although ecthyma occurs most frequently under conditions in which we can hardly regard the nervous system as at fault, yet we possess certain clinical facts which warrant us in assuming, in certain cases at least, the nervous origin of the affection. We sometimes see ecthymatous eruptions following lesions of the nerves (Fischer, of Boston, Wigglesworth, Axenfeld, Weir Mitchell, and Testut). But this form of eruption is much more rare after injuries of the nerves than are the bullous affections. We sometimes see attacks of ecthyma secondary to lesions of the spinal cord (Vulpian, Charcot, Testut, Leloir, and Schwimmer). I gave anatomical proof of the nervous origin of certain cases of ecthyma in a communication presented to

the Société de Biologie in 1880, in which I reported instances of this form of eruption dependent upon changes in the peripheral nerves (parenchymatous neuritis), the posterior spinal roots, and the posterior columns of the cord.

Ulcerations.

Perforating Ulcer.

Every one is agreed at the present day that nearly if not quite all cases of perforating ulcer are of trophic origin, although recognizing that contributing causes, such as pressure, inflammation, or atheroma, play a certain part in the production of this affection. Poncet, of Cluny, was the first to draw attention to the nervous origin of perforating ulcer by his observation that in lepers there are often ulcers of the feet analogous to perforating ulcer. But he did not go so far as Oestlander, who regarded all cases of perforating ulcer as due to leprosy, representing the last traces of that affection in our part of the world.

Poncet was also the first to describe, in 1879, lesions of the nerves in cases of perforating ulcer, but his examination was incomplete as he did not employ osmic acid. Duplay and Morat, in a work since become classical, proved conclusively, by the employment of the proper histological technique, the nervous origin of perforating ulcer. They showed that the nervous lesions concerned in the pathogenesis of this affection are those of atrophic degenerative neuritis (parenchymatous neuritis), absolutely analogous to what we observe in the peripheral portion of a divided nerve, and that the degenerative lesion may be due to various causes, such as changes in the nerve terminations, in the great nerve trunks, in the spinal ganglia, or in the cord itself. They regarded the interstitial neuritis met with in cases of perforating ulcer, to which other authors (Michaud, Sonnenburg, W. Savary, and H. Butlin) later accorded the preponderating rôle in the production of the disease, as secondary to the atrophic degenerative neuritis. This view of Duplay and Morat is similar to that which Déjerine and myself upheld in our monograph upon certain cases of gangrene of trophic origin and of anæsthetic leprosy. Various anatomico-pathological observations made in different countries have confirmed these investigations of Poncet and of Duplay and Morat. Among these are the works of Mazzoni, Fischer, Paul Brun, Sonnenburg, Michaud, Pietro Conti, and others. An interesting form of perforating ulcer, to which Hanot has recently called attention, is that met with in the course of locomotor ataxia.

Ulcus Simplex.

Finally ulcers of various appearances may be met with following alterations of the central or peripheral nervous system (Paget, Weir Mitchell, Gubler, Verneuil, Quénu). There is one variety of ulcer, as yet but little known, the pathogenesis of which is involved in the greatest obscurity; this is the ulceration which appears in the course of muscular atrophy consecutive to a lesion of the anterior horns of the cord, such as progressive muscular atrophy, atrophic infantile paralysis, etc. How are we to interpret these facts which seem to be in contradiction to what we know of the physiology of the cord? The solution of this problem appears to me to be very difficult, if not impossible, for in the different observations we are without any anatomical basis. Have we here to do with complications? We are unable to answer, and the clinical facts, interesting as they are, cannot be satisfactorily explained in the present state of our knowledge.

Gangrene.

Symmetrical gangrene of the extremities, Raynaud's disease, has already been studied in a previous section. Its nervous origin is undeniable, and the only subject for discussion is the way in which the nervous system acts to produce the lesion.

Decubitus.

Samuel was the first to draw attention to certain rapidly forming sloughs, acute decubitus (very distinct from the eschars of gradual formation occurring in the course of certain affections of the brain and spinal cord), appearing a short time after the beginning of the primary disease or of one of its exacerbations. Charcot confirmed the observations of Samuel, and remarked upon the grave prognosis of these cases. We need not dwell here upon the course or the seat of these sloughing ulcers. They have been observed in the course of various cerebral lesions, such as hemorrhage, softening, tumors, encephalitis, meningitis, etc. They are found upon the side of the body opposite to that of the nerve lesion. As yet we do not know the exact portion of the brain, a lesion of which leads to the formation of these eschars. Acute decubitus of spinal origin is wholly analogous, as regards mode of evolution and, in general, prognosis, to acute decubitus of cerebral origin; it is seen in grave traumatic lesions of the cord and the like. Schwimmer has recently observed it in a case of acute spinal meningitis.

Decubitus of spinal origin is seated especially over the sacrum, and Joffroy and Salmon, Viguès, W. Müller, Eulenburg, and others have noted that in the case of unilateral lesions of the cord the sphacelus was located on the side opposite the lesion, that is to say, on the anæsthetic side. The affection is occasionally seen on portions of the integument where there can be no question of pressure as a cause, for example on the anterior abdominal wall, the dorsum of the foot, etc.

Areas of gangrene may occur as a result of lesions of the nerves independently of the centres, a fact which has long been known. In the last century Haller and Quesnay held that section of the nerves of a limb might cause gangrene of the part. This opinion was held up to 1817, when Hebreard and Wolf demonstrated by experiments on a dog that section of the nerves, made after the method followed by Haller and Quesnay, did not give the results claimed by these authors. We find in the literature, however, a number of cases of gangrene following peripheral nerve lesions. I have published in my thesis an interesting case (Obs. XXVII.), from Labadie-Lagrave, of cutaneous gangrene of the face following a neuritis of the trigeminus, and another (Obs. XXX., specimen placed in the Museum of the Hôpital Saint-Louis) of multiple areas of gangrene of the skin due in all probability to lesions of the peripheral nerves. Letulle has recently published in the *Archives de Physiologie* a very similar case. I had the opportunity of studying with Déjerine two cases of gangrene which, as we demonstrated anatomically, argued in favor of the fact that primary peripheral neuritis (parenchymatous neuritis) may be the cause of certain cases of gangrene. These researches were again confirmed by Déjerine in 1882 in a communication presented to the Société de Biologie. Pitres and Vaillard, in their work on primary peripheral neuritis, published in 1883, have also confirmed these facts, showing that certain forms of cutaneous gangrene are to be regarded as secondary to primary neuritis of the peripheral nerves.

Scleroderma.

Although the nervous origin of scleroderma is very probable, and physicians are tending more and more to admit it, yet it has not yet been so certainly demonstrated pathologically that we dare enter upon its discussion in this article. We may mention among recent papers bearing upon the subject the researches of Besnier on scleroderma, the excellent chapter on scleroderma in Schwimmer's treatise, the thesis of Leroy, which contains also some important unpublished

clinical observations of Vidal, and the thesis of Pautry (1883) on morphœa.

The clinical works of Schultze, Wernicke, Wilson, and others, and especially the recent pathological studies of Schwimmer (who found cerebral sclerosis and interstitial and parenchymatous neuritis of the peripheral nerves in a case of generalized atrophy), render very probable the nervous origin of localized cutaneous atrophy and also the generalized form which presents many points of similarity with scleroderma.

Leprosy.

The reader is referred for the discussion of this affection to my work on leprosy (and also to the article on the same subject in a later volume of this series).

Ichthyosis.

The causes of ichthyosis are still involved in great obscurity, although various clinical observations have long afforded a presumption in favor of the nervous origin of certain forms of this affection. We know, indeed, that the skin may assume an appearance suggestive of ichthyosis following lesions of the peripheral nerves. "It seems," says Arnozan, "that this ichthyotic state belongs to cases of neuritis of slow progress." Hunter, E. Home, Weir Mitchell, Eulenburg, Duplay, Schiefferdecker, Fischer, Leloir, and others have noted the occurrence of an ichthyotic state of the skin following various nerve lesions, Duplay and Morat have observed it in perforating ulcer, and Germain and Tédenat in connection with trophic disturbances following old cases of frost bite. It is seen quite commonly on the lower extremities of patients suffering with chronic myelitis, and especially of paraplegics. I have published in my thesis two very well-marked cases (Obs. XI. and XII.) for which I was indebted to Lancereaux.

A variety of ichthyosis which seems to have a certain importance as bearing upon the nervous origin of the affection in some cases is the localized ichthyosis described by Hardy in the "Dictionnaire de Médecine et de Chirurgie Pratiques." German, English, and American dermatologists have reported a number of cases of partial ichthyosis which, judging from their aspect and distribution, were probably due to nervous causes. They presented a strong analogy to congenital pigmentary and papillomatous patches situated along the course of the nerves, and to unilateral nævus described by Baerensprung

and referred by him, without any anatomical proof, however, to a nervous lesion dependent upon congenital changes in the spinal ganglia. These nævi, to which J. H. Simon has given the name of nervous nævi, are always limited to one side of the body, never pass the median line, and follow the course and distribution of the cutaneous nerves. J. H. Simon, Arendt, Thompson, Gerhardt, Neumann, Hardaway, and S. Mackenzie have reported some remarkable instances of the affection, which they regard as of nervous origin. Hebra and Kaposi had already remarked that certain congenital pigmentary and papillomatous tumors present an undeniable relation to the course of the cutaneous nerves, and that the same is true of the papillomatous form of hysterical ichthyosis. Duckworth, Crocker, Tilbury Fox, Connel, Home, Curtis, and Schwimmer have confirmed this opinion by the publication of interesting cases of partial ichthyosis which they regard as of nervous origin.

We see therefore that these various clinical facts render tenable the theory of a nervous origin of certain forms of localized ichthyosis, and perhaps also of more extensively distributed ichthyosis, but more definite pathological investigations are needed to establish this as a certain fact. I have had the opportunity of demonstrating the presence of marked lesions of the peripheral nerves and of the posterior spinal roots in two cases of serpentine ichthyosis (Obs. XIV. and XV. of my thesis); however, I have refrained from drawing too positive conclusions from these facts concerning the nervous origin of the disease, for these patients had during life presented some bullæ of pemphigus, a disease that is accompanied in certain cases by nervous lesions. It is probable, therefore, that ichthyosis is sometimes a trophoneurosis, and sometimes even a constitutional trophoneurosis, as Baerensprung, Tilbury Fox, Crocker, and others admit.

Charcot lent the weight of his authority to the trophoneurotic theory of certain ichthyotic states of the skin. He showed in his clinics that an ichthyotic condition of the skin exists frequently in ataxics, and he regarded the skin affection as a trophic trouble secondary to peripheral or central nerve lesions.

Pigmentary Affections.

The action of the nervous system is most striking in a number of these cases.

Bronzed Skin.

Increase of cutaneous pigmentation in Addison's disease is regarded by most authors as the result of sympathetic nerve troubles. I need not dwell upon this affection, which has already been so well

The Hair.

The influence of the nervous system upon the growth and nutrition of the hair is most evident. Sometimes it would appear that alterations in the nervous system increase the growth of the hair, as manifested by the hypertrophy of the hair on the legs of those suffering with perforating ulcer, the increased growth seen after wounds of nerves, and that following extirpation of the cervical sympathetic in animals. Sometimes, on the contrary, we note a falling of the hair subsequent to lesions of the central or peripheral nervous system. Weir Mitchell, Charcot and Vulpian, Auspitz, Mongeot, and others have reported examples of the sort.

The nervous system occasionally plays an important rôle in the production of *canities*, just as it does in pigmentary disturbances in the skin. This effect is often most striking, and a number of writers have reported instances of it. Not long since F. Raymond published a case of rapid production of canities in a patient suffering with very severe neuralgia of the scalp.

Ought we to regard *alopecia areata*, with the majority of German authors, as a trophoneurosis, or is it a parasitic disease? The question is one that has been much discussed, but is not yet settled. I am inclined to agree with those who hold the middle course. There are many facts speaking in favor of the nervous origin of the affection, and there are also others, not less important, which seem to point to a parasitic origin. It is probable that here, as in many other cutaneous affections, different causes may produce like effects, and that alopecia areata should be regarded as sometimes a trophoneurosis and sometimes of parasitic origin. The statistics of the cases of this affection occurring in Fournier's service at the Hôpital Saint-Louis tend to confirm me more and more in this opinion.

The Glands.

The trophic lesions of the *sebaceous glands* are still too little understood to warrant a discussion of them. Nevertheless, some scattered facts, reported by different observers, give cause for the supposition that the nervous system may sometimes be concerned in the production of certain affections of the sebaceous glands, of some forms of acne, for example. O. Simon, Eulenburg, Lancereaux, and Schwimmer are inclined to regard acne rosacea as dependent upon lesions of the trigeminus, but this relation is still far from being definitely established. In 1881 I saw in Vulpian's service at the Charité

a man suffering with trigeminal neuralgia in whom, a few days after the neuralgic paroxysms, there appeared on the corresponding side of the nose a congestive eruption with little acne pustules.

The limits of this article forbid a consideration of the functional disorders of the *sweat glands*, and the reader is referred to the article on the diseases of these glands in the present volume, and also to the article "Sueur," in the "Dictionnaire de Médecine et de Chirurgie Pratiques," for a full exposition of the subject.

NERVOUS CHANGES CONCERNED IN THE PRODUCTION OF DERMATONEUROSES.

The changes in the nervous system upon which the various dermatoneuroses which we have been considering depend may be briefly considered according to the following plan, which I adopted in a paper published in the *Annales de Dermatologie*, for December, 1886.

I. Dermatoneuroses cum Materia.

Dermatoneuroses secondary to anatomically demonstrable lesions of the central or peripheral nervous system:

1. Primary peripheral nerve lesions:
   (*a*) Of the nerve terminations;
   (*b*) Of the terminal branches of the nerves;
   (*c*) Of the individual nerves;
   (*d*) Of the plexuses.
2. Lesions of the ganglia:
   (*a*) Of the spinal ganglia;
   (*b*) Of certain of the cranial nerve ganglia.
3. Central lesions secondary to alterations in the peripheral nerves:
   (*a*) Spinal;
   (*b*) Cerebral.
4. Primary central lesions:
   (*a*) Spinal;
   (*b*) Cerebral.
5. Sympathetic nerve lesions. The affections belonging to this group are much less well understood than the preceding, for the study of pathological changes in the sympathetic nerves (nerves without myelin) is surrounded with the greatest difficulty. We may say, indeed, that the study of this class of dermatoses is as yet scarcely entered upon.

II. Dermatoneuroses sine Materia.

Dermatoneuroses secondary to modifications leading to disturbances of function in the central or peripheral nervous system, in which, however, no nervous lesion has as yet been anatomically demonstrated.

1. Primary functional disturbances of the peripheral nerves:
   (*a*) Of the nerve terminations;
   (*b*) Of the terminal branches of the nerves;
   (*c*) Of the individual nerves;
   (*d*) Of the nerve trunks;
   (*e*) Of the plexuses.
2. Functional disturbances of the ganglia.
3. Functional disturbances of nervous centres secondary to peripheral nerve irritation (reflex dermatoneuroses, properly so-called):
   (*a*) Spinal;
   (*b*) Cerebral.
4. Primary functional disturbances of the nervous centres:
   (*a*) Functional troubles appearing suddenly: Dermatoneuroses caused by emotions or mental shocks;
   (*b*) Functional troubles of gradual onset: Psychoses, hysteria, insanity, emotions acting through a long period.
5. Functional disturbances of the sympathetic nervous system.

We will now review briefly these divers modifications of the nervous system observed in the several dermatoneuroses, their principal characters, and also the general clinical aspects of the corresponding cutaneous affections.

Dermatoneuroses cum Materia.

As a rule dermatoneuroses secondary to material lesions of the nervous system are permanent affections, or at least do not present the evanescent characteristics so frequently noted in the dermatoneuroses sine materia. They are usually trophoneurotic dermatoses, and exhibit the more profound and tenacious characteristics of this class. However, we must guard against considering every material lesion of the nervous system as inevitably productive, when its effects are manifested in the skin, of a trophic dermatoneurosis. Such a view would be far too absolute. The disturbances of function of the nervous system resulting from a lesion which is appreciable by our present methods of examination, often at first produce purely sensory,

or, much less commonly, purely motor dermatoneuroses. The vasomotor dermatoneuroses following demonstrable lesions of the nervous system are very frequent, and may occur alone or combined with the sensitive or trophoneurotic affections. We often see them constituting one of the earliest symptoms of the nervous alteration.

Although we may in a general way say that the more profound, obstinate, and chronic the cutaneous affection is, the more marked is the nervous lesion upon which it depends, yet this rule is far from being without exception. Furthermore, there is a sort of insensible overlapping of the dermatoneuroses *cum* and *sine* materia, and the types of these two classes are distinctly marked only in the more extreme and exaggerated cases. Nevertheless, we may say broadly that the class of trophoneuroses is the one to which belong the cutaneous affections due to a material nervous lesion.

The lesions of the nervous system which have been noted as productive of dermatoneuroses are the following:

Cerebral Lesions.

The anatomy and the topography of the encephalic lesions which lead to the production of certain dermatoneuroses *cum* materia are still very obscure.

Spinal Lesions.

Dermatoneuroses are very frequently of spinal origin, and it is probable that spinal lesions would be still more often found in cases of cutaneous affection if we more often had the opportunity to search for them. It is probable, furthermore, that these lesions are sometimes so slight that they escape our present means of investigation.

The regions of the cord, the lesions of which are more directly in relation with the cutaneous trophoneuroses, are the posterior root zones and the central and posterior gray substance. The posterior and central gray substance of the cord seems, as regards the skin, to play a rôle analogous to that of the anterior cornua for the muscles. The trophic dermatoneuroses following lesions of the lateral columns or of the anterior gray substance (which have been noted by Charcot, Duplay and Morat, Déjerine, Verneuil, Leloir, Nepveu, and others) appear to constitute exceptions, and ought to be considered as complex cases. It is rare, in fact, in cases of this sort not to find, in addition to the lesions just mentioned, pathological changes in the central or posterior gray matter or in the posterior root zones. Perhaps, however, we might find an explanation of these apparently contradictory facts in reflex action of the irritation of the antero-lateral

columns or of the anterior horns on the trophic cutaneous nerves which emerge from the cord by the posterior roots.

The trophic affections of the skin appear sometimes to be secondary to lesions of the spinal ganglia. Saemmel believes that this is always the case, but his view is much too absolute. As regards herpes zoster, I have shown that we can no longer affirm with Baerensprung that this affection always depends upon a lesion of the spinal ganglia. There are, indeed, many facts in regard to the trophic function of the spinal ganglia which are yet to be satisfactorily explained, and which are apparently contradictory of each other.

In some cases of trophic skin affections I have noted the presence of lesions of the posterior roots, the pathogenesis of which yet remains to be determined.

Peripheral Nerve Lesions.

The anatomical lesion which determines the occurrence of certain cutaneous affections is often a parenchymatous neuritis of the peripheral nerves. This neuritis is sometimes primary, and sometimes secondary to a central disease. For a long time it was believed that, apart from traumatism or pressure, the peripheral nerves could not suffer spontaneous, isolated, pathological alterations without a pre-existing lesion of their trophic centres. Waller's law concerning the trophic centres of the nerves was admitted without opposition, and the dogma had its influence upon the study of the dermatoneuroses.

To Duménil, of Rouen, belongs the credit of showing clearly the individuality and independence of the peripheral nervous system. This demonstration threw a new light upon an entire branch of pathology of the nervous system, and Charcot, Eichhorst, Leyden, Grainger Stewart, Lancereaux, Westphal, Cornil, Déjerine, Pierson, Joffroy, Pitres and Vaillard, and others soon turned to practical account, as regards diseases of the nervous system, this work of Duménil. It ought also to bring about, indirectly, a genuine revolution in cutaneous neuropathology, and extend greatly the list of recognized dermatoneuroses.

The importance and the frequency of primary peripheral neuritis, as regards the production of a large number of dermatoneuroses, upon which I insisted in my papers in 1879 and subsequently, have recently been fully admitted by many eminent authors. Primary non-traumatic parenchymatous neuritis is a quite common affection. It may arise under the influence of cold, of poisoning by various substances, of malaria, or of other infectious diseases. It occurs as a complication in the course of several morbid states of the nervous centres;

but in many cases its origin escapes us. According to the function of the particular nerve affected, it occasions grave disturbances of motility or of sensibility, or various trophic troubles, among which the dermatoneuroses hold an important place. Its influence is becoming more and more recognized and admitted, and its importance is daily becoming more considerable.

It is evident that in many cases these forms of parenchymatous neuritis are secondary to the local action of the virus, microbe, or toxic agents upon the nerve structure. Boeck and myself have demonstrated that occasionally the cutaneous manifestations of syphilis are due to a peripheral parenchymatous neuritis. It is possible that these forms of neuritis may be secondary to lesions of the nervous centres. "Perhaps, just as in the case of the neuro-muscular apparatus, certain cutaneous affections, in which most commonly only lesions of the peripheral nerves have been found, may depend upon alterations in the cellule from which the nerve fibre takes its origin, too slight to be detected by our methods of research yet sufficient to produce evident peripheral lesions." The central lesions certainly occasion peripheral neuritis while sparing the conductors, and the trophic troubles often declare themselves in consequence of relatively very slight causes, given the predisposition.

We cannot do better in closing this rapid sketch of peripheral neuritis as a cause of dermatoneuroses than to present the following classification, from a pathogenic point of view, based partly upon the classifications of Leyden and Déjerine-Klumpke:

- I. Infectious neuritis.
  - Primary
    - Beri-beri.
    - Certain forms of acute neuritis of indeterminate cause.
    - Neuritis from overwork.
  - Secondary: occurring in the course of ordinary convalescence from infectious diseases.
    - Acute: Diphtheria, typhoid fever, variola, cholera, rheumatism (infectious?), puerperal infection, blue pus malady, etc.
    - Chronic: Tuberculosis, syphilis, leprosy, malaria, etc.
- II. Toxic neuritis: Lead, alcohol, arsenic, mercury, phosphorus, carbonic oxide, sulphide of carbon, chloroform, ergot, etc.
- III. Neuritis in diseases marked by a retardation of metabolism (Bouchard): Diabetes, cachexia, chlorosis, anæmia, marasmus, senility, chronic rheumatism, gout, etc.
- IV. Neuritis occurring in the course of cerebro-spinal affections, and appearing independently of these.
  - Ataxic neuritis.
  - Certain forms of peripheral neuritis occurring in the course of various cerebral affections.
  - Pseudo-tabes.
- V. Neuritis a frigore.
- VI. Neuritis of unknown cause.
  - Acute.
  - Chronic.

Spinal Affections Secondary to Peripheral Nerve Lesions.

The dermatoneuroses of this origin constitute an important group, in a way forming a connection between the cutaneous affections secondary to lesions of the cord and those due to peripheral nerve lesions. We have not to deal here with reflex phenomena—those which are merely transitory and produce no appreciable alteration in the central nerve cell excited by the centripetal impression—but rather with actual lesions of the cord, which are secondary to peripheral nerve changes. These dermatoneuroses present the following characteristics:

1. Limited at first to a territory of the skin innervated by the affected nerve or nerves, they may extend to the other areas supplied by other or by all of the nerves arising from the plexus to which belongs the primarily affected nerve; or they may, in consequence of the progressive invasion of the cord, extend to the corresponding parts of the integuments of the other limb; they may even in the course of time, fresh spinal areas being invaded, attack other cutaneous regions innervated by nerves whose trophic centres are in the cord immediately above or below the areas primarily attacked.

2. These dermatoneuroses are very often accompanied by muscular atrophy. The muscles involved are generally those of the limb the integument of which is affected. These muscular atrophies usually present some special features all their own as regards appearance and mode of evolution.

3. Other nervous phenomena, pointing to a more or less marked spinal lesion, precede or accompany these dermatoses. These are lightning, boring, or other pains, muscular twitchings, various alterations of cutaneous sensibility, modified tendon reflexes, etc., etc.—in a word, all the phenomena commonly observed in the more or less extensive forms of diffuse myelitis, or even sometimes in systemic myelitis. These dermatoses may also be complicated by arthropathies.

4. In most cases the cutaneous alterations and the other phenomena with which they coincide do not follow immediately upon the nervous injury, but appear several months, a year, or even several years after it. This fact that they do not come on until months or years after the injury to the nerves distinguishes these dermatoses from the reflex dermatoses, properly so called, which appear almost simultaneously with the nervous excitation. Examples of these latter are erythema consecutive to a cauterization of the cervix uteri, urticaria secondary to the rupture of an hydatid cyst, the erup-

tions due to indigestion, etc. A certain length of time, in fact, is needed before the affected nerve can produce secondary lesions in the spinal cord, but it requires but an instant for a centripetal nervous influence to pass from an irritated nerve to the cord and there determine a more or less generalized impression, and for that to return from the cord to the periphery requires also but an instant.

5. These cutaneous lesions are usually preceded, accompanied, or followed by phenomena of vasomotor origin, such as redness, cyanosis, elevation or lowering of temperature, œdema, and even purpura. These vasomotor phenomena seem sometimes to announce the invasion of regions in the cord and the cutaneous and muscular trophoneuroses which are the consequence of such invasion.

6. Lesions of the nails are observed rather frequently in the course of these dermatoses, and the same is true of disturbances of the glandular secretions.

7. The objective varieties of the cutaneous affections of spinal origin produced by peripheral nerve lesions are very numerous.

Sympathetic Nerve Lesions.

Anatomically and pathologically this class is much less well known than those which we have just been considering, for, as was above remarked, the study of sympathetic nerve lesions is surrounded with the greatest difficulties, and has as yet been very incompletely made.

Dermatoneuroses sine Materia.

This class comprises the dermatoneuroses in which, up to the present time, it has been impossible to discover any appreciable nervous lesion. These affections are in general characterized by simple sensory, vasomotor, or motor troubles, either singly or in combination. When the nervous action has been so intense as to produce an actual permanent trophic lesion of the skin, this cutaneous affection is nevertheless always superficial and non-destructive; but still we may ask whether in these cases there are not some lesions of the nervous system so slight as to escape our present methods of investigation.

We may take as a type of these dermatoneuroses sine materia the reflex dermatoneuroses and those produced by mental shock which we have studied above. The reflex dermatoneuroses, the types of which are the eczemata of dentition, and various eruptions (eczema, urticaria, acne rosacea, etc.) secondary to uterine affections, constitute a group of dermatoses secondary to peripheral nerve irritation and do not depend upon a lesion of the nervous centres but simply

upon a passing irritation of them (Brown-Séquard, Charcot, Vulpian, Hayem). They are thus wholly different from the cutaneous affections of spinal origin secondary to peripheral nerve lesions. These reflex dermatoneuroses—well treated of recently by E. Besnier from a dermatological point of view—have been admirably studied by Vulpian in his classical treatise on the "Vasomotors," and more recently by Mathias Duval in his article with the same title in Jaccoud's Dictionnaire. They are distinguished from the cutaneous affections of spinal origin secondary to peripheral nerve lesions—with which, by reason of their peripheral origin, they might be confounded—by their pathogenesis, their seat, their distribution, and their evolution.

The dermatoneuroses following mental shock have been the object of special study by myself and by one of my pupils. We may, perhaps, interpret their pathogenesis as follows:

"In a healthy subject in whom no predisposition exists a mental shock is limited usually to the production of vasomotor phenomena or disturbances in glandular secretion, or in other cases to that of an evanescent cutaneous neurosis. In those who are predisposed to cutaneous affections such a shock will produce vasomotor or secretory disturbances which become more marked and permanent, just in the same way that an external irritation which is insufficient to cause an eczema in a subject who is not predisposed may in another cause a well-marked attack of the disease."

The dermatoses following mental shock which I have observed are the following: Anæmia, hyperæmia, erythema, urticaria, cutaneous hemorrhages, superficial and catarrhal inflammations of the skin (eczema, psoriasis), herpes, bullous and pemphigoid eruptions, pigmentary affections of the skin and hair, alopecia, etc.

The chief characteristics of this class of dermatoneuroses may be given in a few words:

1. The sudden onset after some mental shock or strong emotion.

2. When the dermatosis does not immediately follow the nervous shock we often see a series of various nervous disturbances, especially cutaneous neuroses, such as pruritus or neuralgia, which announce, as it were, the appearance of the eruption and which separate the cause from the effect—that is, the mental shock from the cutaneous eruption.

3. The onset of the elementary lesions is very rapid; they appear fully grown and do not progress by successive stages.

4. They are, as a rule, superficial, affecting only the upper portion of the derma. They are especially the vasomotor dermatoses (urticaria, erythema, purpura), the catarrhal (eczema, psoriasis, herpes, pemphigus), and the pigmentary (vitiligo, canities).

5. Excessive pruritus is in general an accompaniment of these dermatoneuroses, as are also neuralgic pains, pricking sensations, and lancinating pains.

6. They are of relatively short duration.

7. They occur especially in women.

Two factors especially predispose to these affections, for every one does not suffer from a cutaneous eruption as a result of mental shock; these are (1) A nervous and impressionable condition of the patient, and (2) a predisposition to cutaneous eruptions.

By what mechanism does the nervous system produce cutaneous lesions so varied in their nature and in their intensity? The answer is easy as regards the sensory, motor, and vasomotor neuroses after reading the works of Brown-Séquard, Charcot, Vulpian, Erb, Mathias Duval, Leyden, and others on the pathology of the nervous system. It is not easy as regards the trophic dermatoneuroses. The limits of this article will not permit us to dwell upon the physiological questions concerned. The works of Snellen, Virchow, O. Weber, Vulpian, and others teach us that the vasomotor theory is sufficient to explain the occurrence of the trophic skin affections, and that the vasomotor phenomena should be considered as contributing causes. The theory of trophic nerves, as formulated by Samuel, cannot be accepted by any physiologist. It is impossible, indeed, to admit with this author the existence of special nerves to which he gives the name of trophic nerves and for which he has described a special course. Their existence has never been demonstrated either experimentally or anatomically. The occurrence of muscular atrophy after the section of a motor nerve, or that of trophic troubles of the skin after the section of a sensory nerve, by no means proves that the motor or sensory nerves contain special fibres whose function is to regulate the nutrition of the tissues to which they are distributed. The nutrition of the skin or of the muscles is regulated by impulses received through the sensory or motor nerves, without the necessity of assuming the existence of other nerves.

The theory of direct irritation, which has been warmly defended by Weir Mitchell, Brown-Séquard, and Charcot, has been vigorously opposed by Vulpian, Erb, Eichhorst and others, and has now been abandoned or is regarded as at most applicable to only a few exceptional cases. Since the above-mentioned theories must be rejected, we are obliged to admit with Vulpian that these changes in the skin depend upon a weakening of the trophic influence exerted upon the tissues by the nervous centres—an influence which is probably transmitted to the tissues by the sensory fibres and in part also by the sympathetic nerve filaments. But the theory of direct trophic influence is insufficient

in itself to explain the facts observed. The cutaneous troubles are, in fact, more frequent in cases of incomplete injury of the nerves, and the resection of the diseased nerves sometimes arrests completely the trophic disturbances. Vulpian, therefore, advances the hypothesis that through the intermediary of the irritated nerve fibres there is produced a modification of the influence which the trophic centres of these nerves exercise upon the skin, and this morbid influence is conveyed to the skin through the nerve filaments which remain intact. He thus arrives at the theory of reflex irritation of the skin, an opinion which was held by Weir Mitchell, and apparently also by Hayem and Hallopeau. But afterwards rejecting this theory of reflex irritation, Vulpian finally concludes that the centripetal irritation acts upon the nervous centres in such a way as not to exaggerate the trophic influence of these centres, but rather to diminish or even abolish it. This diminution of trophic influence is produced either directly by destruction of the nerve fibres or of the trophic centres, or reflexly through diminished action of these trophic centres as a result of the centripetal irritation of them.

We see then that apparently the most diverse modifications of the nervous system may give rise to cutaneous affections of the most varied character. We have seen also that in certain cases functional changes in the nervous system may give rise to cutaneous affections similar to those that are observed as a consequence of appreciable nervous lesions, and conversely.

If the theory which I have advanced be accepted—namely, that the pathological phenomena occurring in the skin in consequence of altered innervation are analogous to those which take place in a gland—we shall have a very simple physiological formula by which to interpret the cutaneous affections of nervous origin. Here again we shall see verified the opinion of Claude Bernard that pathological processes are analogous to physiological ones. The more or less marked weakening of the trophic influence of the nervous system upon the skin, the more or less prolonged duration of this change, the combination in certain cases of trophic disturbances properly so-called with vasomotor phenomena, the more or less marked predominance of one or other of these phenomena, would perhaps sufficiently explain the varied aspects of cutaneous troubles following apparently identical lesions of the nervous system. The influence exerted by secondary causes, such as external irritants and the like, may also account for some of these differences in aspect of the lesions.

In conclusion we may recall the fact that these cutaneous affections may, in certain cases, enable us to diagnosticate a nervous trouble which, except for them, would have passed unnoticed or

would have been recognized only at a later period when the prognosis as well as the treatment would have been very different. We know, indeed, that nervous affections may often imprint their seal upon the cutaneous surface, and that in certain cases the skin may be regarded as the mirror of the nervous system. We should always, therefore, when in the presence of a patient suffering from one of the cutaneous diseases which we have been considering in this article, institute a careful examination in order to determine whether there may not be some lesion of the central or peripheral nervous system to account for the trouble.

In regard to the affections which I have called *dermatoneuroses indicatrices*, it would be interesting and useful to make an investigation on the basis of a large number of carefully observed cases in order to determine whether these cutaneous affections may not indicate a sort of predisposition to certain nervous affections which may be expected to show themselves after a longer or shorter interval. We find, indeed, upon studying with care the antecedents of patients suffering from various nervous affections that they frequently have been, at a more or less remote period, attacked once or oftener with certain cutaneous troubles. It is not rare to see patients presenting evidences of the *vice dartreux*, the "herpetics" of Bazan and Lancereaux, suffering in later years from more or less grave diseases of the nervous system.

Thus cutaneous affections may precede during weeks, months, or even years the symptoms of material lesions or simple functional disorders of the central or peripheral nervous system. We need not insist at length upon the importance of these indicator dermatoneuroses in regard to diagnosis, prognosis, or treatment. What we have to diagnose in these cases is not so much the cutaneous affection as it is the nervous affection which causes it and of which the dermatosis is but a reflection. We should search for the part of the nervous system which is diseased in a patient presenting an indicator dermatoneurosis, and when found, that is the affection which is to be treated. In this way the skin disease will often be caused to disappear, a matter of some moment to the patient; but what is of more importance, we shall in this way often be able to prevent the development of nervous lesions which may incapacitate or even kill.

TREATMENT.

As I have insisted for many years past, in the treatment of a dermatoneurosis of whatever sort, we must first of all prevent the contact of air, of external irritants, or friction of the skin. Whether

we have to do with a dermatoneurosis *cum* materia or *sine* materia, it is of the greatest importance to prevent the deleterious action of external agents upon a skin which needs but slight excuse to become inflamed, ulcerated, or necrosed.

In order to meet this indication I have employed in hospital as well as private practice occlusive dressings, by means of ointments spread in a thick layer on cloth and covered with wadding, or the gelatins of Pick or Unna, also covered with wadding, or medicinal soaps, varnishes, medicated plasters, Unna's plaster mulls, muslin saturated with medicinal substances, covered or not covered with wadding, drawers, shirts, or gloves, or various tissues or other substances, etc., etc. Jacquet confirmed the utility of this method when he published the technique of his wadding dressing.

In certain cases of pruriginous dermatoneuroses I have resorted to the scarifications recommended by Vidal. I have sometimes obtained rather favorable results by pricking the diseased portion of the skin with a needle, this more especially in the pruriginous dermatoneuroses accompanied by more or less circumscribed œdema of rapid appearance and in congestive and œdematous perifollicular lesions, especially certain varieties of eczema of the hands and fingers. I have obtained a measure of success, varying in different cases, by applications of vasoconstrictor agents, such as alcohol or alcoholic solutions of ergotin or ichthyol.

Since 1884 I have frequently employed counter-irritation by means of the actual cautery, of tincture of iodine, of sprays of chloride of ethyl, chloroform, and so forth, over the spine or along the course of the nerves.

Oblique warm douches to the spinal column, as devised by Vidal, have often been of service to me. Brocq, Jacquet, and others have had a similar favorable experience with this method.

Electricity (continued and interrupted currents) has been recommended in the treatment of trophic ulcerations by many, and Bulkley, Graham, Blachez, and others have employed with more or less success the continued current in the treatment of morphœa and vitiligo. Beard, Kinsman, and Fitsch have recommeded continued currents in the treatment of a number of cutaneous affections, especially eczema. The continued current has also been of service in my hands in the treatment of the dermatoneuroses which we have been considering. It is worthy of special note in this connection that Silvio Aranjo, of Rio Janeiro, has obtained very remarkable and encouraging results in the treatment of elephantiasis by continued currents.

I have cured a number of cases of localized cutaneous pruritus, of pruritus vulvæ, and pruritus ani, which had resisted all other thera-

peutic measures, by means of electrolysis. This method is, however, very painful and is applicable only to the treatment of localized forms of pruritus. I have abandoned the use of faradization with the brush electrode, having found it very uncertain in its effects.

During the past two years I have employed electrical effluvation in about twenty-five cases of most obstinate localized or generalized pruritus, with unexpectdly beneficial results. With the assistance of my colleague, Professor Doumer, I have treated in this way patients affected with vulvar and anal pruritus and pruritus of the extremities. A large number of these patients were cured at the end of a variable number of séances, and the eczematous or lichenoid condition consecutive to the pruritus also disappeared. In certain other of the cases a more or less marked benefit was obtained although the pruritus was not entirely relieved. Finally, in a few cases the affection was rebellious to this mode of treatment. I obtained similar results in the treatment of generalized pruritus, although here the benefit was not so pronounced as in the localized forms of the affection.

The following is the procedure which I have adopted in the employment of effluvation: The patient is placed upon a stool with glass feet and is connected with one of the poles of a strong static machine, then a metallic point connected with the other pole of the machine is brought to within ten or fifteen centimetres (four to six inches) of the affected part. When this is done the patient has a sensation as of a breath of cool air accompanied sometimes by slight pricking which is not at all disagreeable. The metallic point should be moved slowly about over the entire diseased area. The séance should continue for from twelve to fifteen minutes, rarely longer.

I have also, in collaboration with Professor Doumer, treated by effluvation a large number of cases of other forms of dermatoses, such as eczema, lichen, urticaria, morphœa, vitiligo, local asphyxia of the extremities, trophic ulcers, varicose ulcers, trophoneurotic alopecia, etc., but the results obtained were very uncertain. It would seem, therefore, premature to enter upon an extended discussion of this mode of treatment, but I may say that the results obtained may be classified as follows: sometimes the nervous phenomena as well as the cutaneous lesion were greatly benefited. Sometimes the nervous phenomena were benefited without any appreciable amelioration in the cutaneous affection. Sometimes neither the cutaneous affection nor the nervous phenomena were benefited. Sometimes the nervous phenomena remained stationary, while the cutaneous affection was made worse. Finally, both nervous phenomena and cutaneous affection were made worse. Up to the present

we have not been able to determine exactly under what conditions the treatment failed to relieve or even increased the dermatoneurosis.

The *internal treatment* of these affections is less simple and will vary much according to the individual case, but in general quinine, the valerianates, ergotin (employed by Bulkley), strychnine, hyoscyamine, and bromide of camphor appear to give good results. Arsenic, given either alone or in combination with one or more of the above-mentioned remedies, sometimes gives excellent results. We know, indeed, that arsenic exercises a powerful action upon the nervous system; Bulkley has recorded a case of eczema of the fingers, evidently of nervous origin, which was cured by arsenic in large doses, and I could relate a similar instance. Hypophosphites and kola are also indicated in certain cases. In a word, we must, according to special indications, resort to the various tonics and sedatives of the nervous system.

A similar effect is obtained by various hygienic measures, such as mental and physical repose, a life in the open air, moderate gymnastic exercises, isolation, etc., the treatment, that is to say, of neurasthenia, which is so frequently observed in cases of dermatoneuroses. Much benefit may also be obtained in certain cases by the use of mineral waters and a sojourn at some suitable mountain resort.

We must remove, or at least treat the peripheral or visceral troubles (gastric, uterine, nasal, etc.), which may cause irritation of the nervous system. We must not forget that many patients with dermatoneuroses are arthritics, in the wide acceptation of the term, and often also are sufferers from auto-intoxication. The action of the kidneys and of the liver should be carefully regulated. Finally we must not lose sight of the possibility of poisoning by alcohol, ether, tobacco, coffee, carbonic oxide, etc., and also of malarial infection, and must act accordingly. I have seen several cases of very obstinate dermatoneuroses rapidly cured by the suppression of one of the intoxications mentioned, especially the alcoholic and the carbonic oxide.

As I have remarked in former treatises, dermatological therapeutics should be based on the symptomatology, pathological anatomy, and physiology—in a word, on a very exact knowledge of the disease. If unfortunately empiricism plays a considerable part in therapeutics, and especially in dermatological therapeutics, the latter is because the true nature of the dermatoses often escapes us; when, however, we have the good fortune to discover the cause of the malady, we should direct our therapeutic measures against it. I believe that just as the recognition of the parasitic cutaneous affections has changed completely a considerable division of dermatological thera-

peutics, so a more intimate knowledge of the trophic skin disease will transform this section of treatment and will direct the researches of specialists into really scientific channels. Unfortunately this labor is a most difficult one, and we are very far yet from the goal towards which we are striving.

This rapid sketch will suffice, I hope, to show how difficult and complex is the treatment of the dermatoneuroses; but it will show also how this subject has been rendered more precise and at the same time widened since it has come to be recognized that, as I wrote in 1881, "the skin ought to be regarded in very many cases as the mirror of the nervous system."

The Sensory Dermatoneuroses.

Dermatalgia and Hyperæsthesia.

There is no true symptomatic treatment of dermatalgia and hyperæsthesia, and it is by addressing our measures to the removal of their cause that we may most surely overcome them. They sometimes disappear spontaneously in the course of several weeks or months, but more frequently we are obliged to resort to local and general treatment for the relief of the causal malady.

In so-called rheumatismal dermatalgia Beau has recommended the application of a blister *in loco dolenti*. Blisters have sometimes given good results in hysterical dermatalgia also. Punctate cauterizations along the course of the diseased nerves are sometimes useful.

Hypodermic injections of morphine made in the painful regions have been found efficacious by Weir Mitchell, especially in causalgia. We may also try applications of tincture of iodine, aconite or belladonna. The application of the following ointment has sometimes given me good results in the treatment of certain forms of dermatalgia and cutaneous hyperæsthesia, especially of those which are dependent upon lesions of the peripheral nerves:

Iodide of potassium, ...	10
Extract of opium, ...	10
Extract of belladonna, ...	12
Vaseline, ...	30

In other cases compresses moistened with chloroform, after the method of Vulpian, or with alcohol or certain tinctures, has also given good results. I have less often had recourse to sprays of chloride of methyl, as recommended by Debove, or to sprays of bromide of ethyl or of ether.

The application of electricity, either the continuous current, the interrupted current, or effluvation, has given very uncertain results in my hands and ought to be employed only with great care, although I have found it of service in certain cases.

Duhring advises the use of vapor baths. In some cases I have obtained good results from Turkish baths followed by massage. Tepid douches applied especially along the back, after the method of E. Vidal, are often very useful.

The general treatment will vary according to the case. Tonics, however, and nervous sedatives are in general indicated, especially the bromides of potassium or of camphor, the valerianates of ammonia or quinine, other salts of quinine, especially the bromohydrate, aconitine, morphine, and the glycerophosphates. Arsenic, kola, coca, strychnine, and iodide of potassium may be given to meet special indications.

It may be readily understood also that hygienic measures, intellectual and moral quietude, change of air, recreation, and travel will give excellent results in the treatment of dermatalgia and of hyperæsthesia, in neurasthenic and other nervous subjects.

Pruritus.

Not only does pruritus constitute an eminently distressing and fatiguing affection which may influence more or less injuriously the general health, but unfortunately this dermatoneurosis is very often most difficult to cure. In consequence of its obstinacy to treatment the affection often wearies to the utmost the dermatologist, and not uncommonly exposes him to blame on the part of the patients, who cannot understand why he is unable to relieve an affection which is so inappreciable in an objective sense, while every day they see other cutaneous troubles, apparently much more formidable, speedily and effectually cured. But although it is necessary for the physician to know that the prognosis of pruritus is generally serious, sometimes even very grave, it is necessary also for him to have a knowledge of all the therapeutic measures at his disposal, and to act with the greatest prudence, in order to do the patient no injury, an accident that sometimes unfortunately happens.

When called upon to treat a case of pruritus we must first of all make sure that the itching is not symptomatic of some cutaneous disease, parasitic or other. This exclusion, which is sometimes a matter of no small difficulty, once being made, a most thorough and minute examination should be instituted, at the same time not forgetting that pruritus must often be regarded as a *dermatoneurose indicatrice*

of various other conditions. The hereditary and personal antecedents of the patient should be inquired into with great care, for we must remember that the subjects of pruritus are often nervous arthritics or the descendants of rheumatic, gouty, or neuropathic individuals. All the functions and all the systems of the economy should be subjected to a careful investigation. The urine should be carefully and repeatedly analyzed, both qualitatively and quantitatively, not limiting our investigation to the determination of the presence of glucose, albumin, urates, phosphates, etc., but also of peptones, the toxic excrementitious products, oxalates, etc. In certain cases even the analysis of the blood has given me material assistance. We should not forget to ask the patient as to his habits, his profession, his manner of living, and his moral condition, questions which are often of great importance and may give most valuable therapeutic indications. In a word we should first of all endeavor to ascertain whether the pruritus has a cause and what the nature of it may be, for the success of treatment depends upon the recognition of this cause which it must be our endeavor to suppress if possible. These considerations may appear trivial, but it is nevertheless important to insist upon them, for they are too often forgotten.

In many instances, however, unfortunately too many, the cause of the itching is not apparent or tangible or we are unable entirely to remove it. We are then obliged to resort to a treatment directed solely to the suppression of the symptom, pruritus.

General Treatment.

The general treatment of pruritus is (1) hygienic and alimentary, and (2) internal or medicinal.

Hygienic and Alimentary Treatment.—Patients suffering from pruritus should be placed upon a strictly regulated diet. They should abstain from the use of coffee, tea, alcoholic beverages, undiluted wine, salt or canned meats, fish or cheese, game, sausages, shell fish, spices, truffles, tomatoes, strawberries, asparagus, cabbage, and sorrel. Their diet should be composed chiefly of eggs, milk products, roast or broiled meat and fowl, cooked green vegetables, and cooked fruits. As Besnier and Doyon have well said, the diet of these patients should be most carefully regulated in accordance with their idiosyncrasies. In severe cases a milk diet is specially indicated, but we must not forget that there are some persons who cannot digest milk.

The bowels must be regulated and diuresis should be favored; the female sexual functions should also be carefully looked after. An endeavor should be made to promote the functions of the skin without

causing irritation, either by means of dry friction or, according to the case, frictions with alcohol, tepid or cold lotions, baths, or even in some cases Turkish baths, which have occasionally given me excellent results.

The patient should be cautioned to avoid as far as possible anything which may excite the nervous system, such as late hours, mental emotions, intellectual overwork, and all sedentary pursuits. He should be advised to be as much as possible in the open air, to live in the country, to travel, and to seek diversions and exercise proportioned to his strength. A moderate use of the bicycle has given excellent results in several of my cases.

The physician should pay special attention to the clothing of the patient, which should be loose. The patient should avoid all sudden changes of temperature. We may often be obliged to forbid the wearing of wool against the skin and to recommend the patient to wear between the woolen underclothing and the skin thin garments of cotton. In other cases silk is very well tolerated by the skin. The patient should frequently change his underclothing. He should also avoid too heavy bedclothing.

Medicinal Treatment.—In treating a case of pruritus we must remember first of all that many drugs are capable of exciting or increasing the itching in those who are subject to this trouble, and we should, therefore, use great care in our choice of remedies for such patients.

Among the apruriginous remedies I agree with E. Besnier and Brocq in placing in the first rank valerian and its compounds, especially valerianate of ammonia; there is no other of the nervines which can be compared to this in its efficacy and ease of administration. I frequently prescribe the extract of valerian in pills containing 0.25 gm. (gr. iv.) either pure or mixed with equal parts of extract of rhubarb, two to eight pills being given in the course of the day at mealtimes. But the valerianate of ammonia is without question much preferable. I usually prescribe it in capsules, because of its disagreeable odor, and more rarely in suppositories or by enema. The valerianate of zinc is indicated in certain cases.

It is only when the valerianates have proved inefficient that we may give preparations of the bromides, chloral, sulfonal, or opiates, but these preparations should be employed with the greatest circumspection, for they are very uncertain in their effects and may even in some cases themselves produce an eruption. I have, however, often found the bromide of camphor of real service.

Atropine has been advised by some authors, among others Besnier, in doses of 0.00025 gm. (gr. $\frac{1}{400}$). It should be used, however,

with extreme care. The preparations of stramonium, hyoscyamus, veratrine, or brucine, may be of service in exceptional cases. Pilocarpine may be specially mentioned as having succeeded in certain instances—very rare, it must be confessed.

Musk, castor, cherry-laurel water, and hydrocyanic acid have sometimes been of service, but I much prefer asafœtida, especially when given in suppository; this is of particular value in cases of pruritus ani.

We may sometimes give with advantage tincture of cannabis indica or gelsemium, either singly or combined. I quite often prescribe a mixture of seven drops of the tincture of gelsemium and fifteen drops of the tincture of cannabis indica, given in a glass of sweetened water daily at mealtimes. Lebel recommends powdered teucrium scordium in doses of 0.50 to 1.0 gm. Other remedies which have been well spoken of are antipyrin, phenacetin, and salicylate of sodium. Following the recommendation of Hebra, Besnier, Brocq, and several other dermatologists, I have tried carbolic acid in several obstinate cases of pruritus and have occasionally, though not always, been satisfied with its action.

In many cases we have to resort not to sedatives but to tonics of the nervous system; thus quinine, especially the valerianates, strychnine, the hypophosphites, the phosphates, and the glycerophosphates, especially of lime, have often given me great satisfaction, especially in the case of debilitated subjects.

I have never observed any marked benefit from the use of arsenic. It is needless to say that the above-mentioned remedies are not the only ones which we may employ, and in such an obstinate affection the physician has a large choice of remedies to which he may resort one after the other in case of continued insuccess, provided that their effects upon the patient be carefully watched.

In many instances a course of treatment by mineral waters may render efficient service, but this should be prescribed by the physician only after a careful study of the individual indications.

Sometimes counter-irritation along the spine by means of tincture of iodine, the actual cautery, or spinal douches may exercise a favorable influence upon the pruritus.

Local Treatment.

As I wrote in 1884, it is before all necessary, whatever may be the form of dermatoneurosis with which we have to deal, to avoid contact with the air, with external agents, or with anything causing friction on the skin, and thus acting upon the cutaneous terminal

nerve filaments. This rule, upon which I have so strongly insisted in the treatment of all nervous affections of the skin, is equally applicable to the treatment of pruritus.

The local treatment of this affection necessitates, according to the case, the employment of (1) lotions; (2) powders; (3) simple dressings; (4) salves and pastes; (5) plasters; (6) medicated glues, gelatins, and soaps; (7) adhesive pellicles. Thus we see that the basis of the local treatment of pruritus consists in the application of occlusive dressings. To these measures we must add: (8) baths; (9) certain surgical procedures, such as linear scarifications (Vidal), acupuncture (Leloir), ignipuncture (Besnier), or even more radical operations; (10) electricity in some one of its various forms.

Lotions.—The number of lotions which have been recommended for the relief of itching is very great, and I shall limit myself to the mention of those only which have received the approval of dermatological authorities, dwelling a little more in detail upon those which I have personally found to be of service. We may say that almost every slightly caustic or sedative substance has been tried at one time or another. We may mention, after Brocq, in the order of their strength, decoction of elecampane root, hops (lupulin), camomile heads, or bran water; we may add to any of these liquids vinegar (one to four tablespoonfuls to the glass), dilute lead water, yellow wash (added in the same amount as the vinegar); spirit of camphor one part to three of hot water, lotions of salicylic acid in alcoholic solution, of sulphuric ether, benzin, or borax, alone or mixed with spirit of camphor and glycerin (Duhring); lotions of bromide of potassium one to ten per cent., of chloral one to five per cent. with or without cherry-laurel water; lotions of chloral camphor with dilute hydrocyanic acid, in the strength of 4 to 8 gm. in 500 gm. of aqua lactucæ or of milk of almonds; lotions of cyanide of potassium five per cent., of sulphide of sodium ten per cent., of sulphate of copper one to five per cent., of tar, of ichthyol (ichthyol 10 to 30 gm., water 100 gm.), of naphthol one to two per cent., of thymol in glycerin and alcohol, of the fluid extract of grindelia robusta diluted with water, of a decoction of coca leaves, of belladonna, of hyoscyamus, of aconite, of tobacco (two to four large tobacco leaves to a litre of hot water), of extract of conium, of creolin (2 to 4 gm. in 100 gm. of linseed oil); finally and especially applications of nitrate of silver 1 : 50, 1 : 30, 1 : 20, or even 1 : 10 (feasible only where the pruritus is of limited extent), lotions of carbolic acid one or two per cent. (for example, one to four tablespoonfuls of a 1 : 20 solution of carbolic acid in a cupful of hot water or hot infusion of camomile); Duhring adds caustic potash to the carbolic acid in the proportion of one part of

potash to two parts of the acid. The following combinations may also be employed:

Pure glycerin, Lime water, Cherry-laurel water,	ãã partes æquales.
Tincture of cannabis indica,	5
Bromide of sodium,	5
Hydrate of chloral,	10
Pure glycerin,	50
Rose water,	100

The following are some lotions that have given me great satisfaction in a number of instances. I employ as a menstruum an infusion of one or of several of the following-named plants, according to the case, and in the order of frequency: camomile, elecampane root, sweet clover, sambucus, coca leaves, guaco, solanum, dulcamara, lettuce, belladonna leaves, gelsemium leaves, aconite leaves, conium; to each half cupful of hot infusion (for the lotions ought always to be used very hot) I add one or several teaspoonfuls, according to the case, of one of the following solutions:

Creolin,	8
Carbolic acid,	2
Cologne water,	100
Creolin,	2
Carbolic acid,	2
Resorcin,	4
Cologne water,	100
Essence of wintergreen,	1
Thymol,	2
Resorcin,	4
Cologne water,	100
Creolin,	4
Resorcin,	1 or 2
Cologne water,	100
Resorcin,	4
Ichthyol,	4
Cologne water,	100
Carbolic acid, ichthyol, creolin, or thymol,	2
Resorcin,	4
Tincture of aconite,	2
Tincture of belladonna, Tincture of hyoscyamus,	ãã 4
Cologne water,	100
Borax	8
Glycerin,	20
Cologne water,	100

These lotions may be combined or the individual ingredients may be varied as regards the relative quantity. A lotion which has given me satisfaction in many cases is one composed of twenty parts of tar in fifty parts of alcohol or cologne water. This may be applied pure in certain cases of localized itching, but in most cases it will be necessary to add to a half-cupful of one of the above-mentioned infusions, one or several teaspoonfuls of the tar solution, or of the following:

Tincture of belladonna,		
Tincture of hyoscyamus,	ää	1
Tar,		36
Cologne water,		50

I cannot speak too highly of the value of the alcoholic solution of tar, especially of extractum fagi, in the treatment of pruritus, more particularly of the localized forms. I have often used these solutions in full strength without any admixture of the above-mentioned infusions. Of course we ought to employ none of these external remedies without great care, watching closely the special irritability of the skin of each patient.

The liquor anthracis compositus of Fisch, of Berlin, has been employed by me too seldom to enable me to speak definitely of its therapeutic value.

The lotions should always be applied hot or warm, and the skin should be moistened, not by rubbing but by sopping it with little wads of antiseptic cotton. As soon as the lotion has been applied the parts should be thoroughly dusted with one or other of the powders mentioned below.

I never employ solutions of nitrate of silver except as a last resort in certain cases of localized pruritus.

Powders.—The following are the powders which I am most in the habit of employing:

Salicylic acid,		1
Oxide of zinc,		30
Starch powder,		60
Borax,		2
Talc,		10
Oxide of zinc,		30
Rice starch,		60
Carbonate of bismuth,		3 to 6
Rice starch,		60
Talc,		
Oxide of zinc,	ää	5
Salicylate of bismuth,		10
Rice starch,		90

These powders may be combined in various ways and the quantities of their several ingredients may be changed to suit the particular case. They ought to be prepared with the greatest care, well sifted, free from all hard particles, in a word, absolutely impalpable. They should not be rubbed on the skin but simply dusted over it or applied by means of a wad of absorbent cotton. These powders are very adhesive, especially when they are well applied after the lotion, the parts being still moist. After their application it is well to cover the diseased surfaces with a piece of old, soft linen, unstarched cheesecloth, or lint.

Simple Coverings.—In many cases the application of a dressing, preceded or not by lotions or medicated powders, constitutes the basis of treatment of pruritus. The dressing may be a simple dry dressing of impermeable tissue, or gauze moistened in some one of the above-mentioned solutions. The applications of salves or pastes which should be made, not by spreading the ointment on the skin but by spreading a thick coat of it on soft linen and then applying to the skin, also constitutes one variety of dressing; and the same is true of plasters, glues, gelatins, soaps, and adhesive pellicles.

In all these cases the principle is the same, for it consists in (1) the suppression by means of the dressing of the action of external agents, and (2) the action of medicinal substances which these protective applications may contain. In certain cases it is sufficient to protect the itching parts by means of clothing, woven drawers, and the like, gauze dressings, or cotton wool dressing advocated by Brocq and Jacquet. It is often well to precede this dry dressing by the application of some medicated powder.

In other cases Besnier and Doyon recommend warmly the enveloping or swathing of the whole of one portion of the body with very fine rubber tissue. During the night, or in some very severe cases, Besnier and Doyon interpose between the rubber tissue and the skin pieces of gauze or of lint, moistened in some one of the various solutions given above. These pieces of lint or gauze should be well wrung out and should be warm when applied, and then covered with a very thin impermeable tissue, maintained in place by means of soft gauze bandages.

Salves and Pastes.—In many cases we may obtain good results by the application to the affected parts of pieces of fine linen or of unstarched gauze, folded several times and covered with a thick layer of a suitable paste or salve. The dressing may be preceded by the application of the lotions and powders above mentioned. The ointments which I prescribe most frequently are the following:

Borax or salicylic acid,		2. gm.
Oxide of zinc,		20.
Rice powder,		70.
Lanolin,		
Vaseline,	āā	40.
Borax or salicylic acid,		2. gm.
Salicylate of bismuth,		20.
Rice powder,		70.
Lanolin,		
Vaseline,	āā	40.

With the above salves we may incorporate when necessary tar, or oil of cade in the proportion of 1 : 80 or 1 : 50; carbolic acid or thymic acid, 1:300 to 1:500; menthol, 1:50 to 1:100; ichthyol, 1:80 to 1:150; hydrate of chloral, 1:50 to 1:100; camphor or bromide of camphor, 1:30 to 1:100; essence of wintergreen or rosemary, 1:200 to 1:500. I often add to these ointments, extract of belladonna, of hyoscyamus, of conium, of opium, or of valerian, in the proportion of 1:50 or 1:100.

The above-mentioned ointments are those which I most frequently employ, but it is understood, of course, that the proportions of the various ingredients may be altered to suit the needs of the practitioner in each individual case. I have by no means exhausted the list of substances which have been used by one and another in the effort to relieve itching, and the physician is at liberty to employ other remedies which may appear to meet special indications. In certain cases the casein ointment recently introduced into dermatological practice by Unna may be found useful.

Plasters.—In certain cases plasters may be profitably used in the place of ointments. These plasters have been greatly improved in recent times, as regards especially their smoothness and flexibility, and they will be found to be of real practical utility in certain cases of pruritus. The plasters which I employ most frequently are the cod-liver oil plaster of Vidal, Vidal's red plaster (cinnabar 3 parts, minium 5 parts, and diachylon 52 parts), plasters of oxide of zinc, of salicylic acid, of essence of mint, of menthol, of resorcin, of ichthyol, etc., to which I often add tar, extractum fagi, carbolic acid, creolin, antipyrin, phenacetin, etc. Some writers also advise the use of Vigo's plaster and simple diachylon plaster.

Medicated Glues, Gelatins, and Soaps.—The medicated glues and gelatins, such as have been formulated by Unna and Pick, are quite useful. I frequently have recourse to them, especially to the medicated gelatins, taking care to cover the gelatin which has been applied, while it is still soft, with a thin layer of wadding. Pick has had very good results from covering the affected regions

with medicated soaps. The unguentum caseini, recently introduced by Unna and Beiersdorf, is a convenient form of application; many medicinal substances may be incorporated with it; the following is its formula:

Benzoic acid,	1.00
Oxide of zinc,	2.00
Caustic potash, or soda,	0.48
Glycerin,	7.00
Pure casein,	14.00
Vaseline,	21.00
Water,	100.00

Adhesive Pellicles.—These pellicles, or traumaticin, when medicated, may be used with benefit in certain cases. Various antipruriginous substances may be incorporated with them to meet special indications.

Balneotherapy.—Baths must be prescribed in the treatment of pruritus only with the greatest caution, for while their use may indeed be followed by the best results, when opportunely administered, yet it must be understood that in certain cases they are not only not useful but even actually prejudicial.

The baths may be of short duration (ten to fifteen minutes) or very prolonged (from several days to several weeks). Continuous baths given after Hebra's method may be sometimes of great service in very grave and obstinate cases of generalized pruritus, as I have myself had occasion several times to observe. When the baths are of short duration we may very conveniently add various medicinal substances to the water. I frequently prescribe for adults baths containing a pound of starch, a pound of gelatin, and either two tablespoonfuls of creolin, or two pints of a 1:200 carbolic-acid solution, or a pint of wine vinegar, or a pint of a 1:200 thymic-acid solution, or two pints of cologne water, or three and one-half ounces of tincture of benzoin, or seven ounces of borax. In addition to one or another of these various solutions, I often mix with the bath two pints of pure glycerin. Sometimes I replace the pure water with infusions of linden flowers, of hops, of marshmallow, or of camomile, or with bran water. Some authors have recommended alkaline, sublimate, or sulphur baths, but I do not employ them.

Vapor baths, and especially hot-air baths (Turkish baths), by stimulating the skin and promoting diaphoresis, are often of undoubted service in appropriate cases. The same is true of warm douches and especially of douches applied obliquely along the spinal column, after the method employed by Vidal.

Immediately upon the conclusion of the bath, it will be necessary

to apply the appropriate dressing. The application of an alcoholic solution of tar or of beechwood extract will often be useful in such cases.

Surgical Measures.—In certain cases of localized pruritus ignipuncture has been employed with considerable success. E. Vidal has obtained good results by means of linear scarifications. I have sometimes found multiple punctures made with a fine needle quite beneficial. There are even cases of severe localized pruritus in which surgeons have removed the affected portion of the integument, following the operation by skin-grafting after Thiersch's or other methods.

Electricity.—The employment of this agent sometimes gives good results in the treatment of pruritus, especially of the localized forms of the neurosis. The manner of applying the electricity to which I have most frequently resorted is that of effluvation. What I have said concerning this method in the general section on the treatment of the dermatoneuroses (p. 862) applies with equal force to its employment in pruritus, and I need not repeat it here. The continuous current has in certain rare instances given very unexpected good results. I have also succeeded in curing some cases of localized pruritus which had been rebellious to every other therapeutic measure, by means of electrolysis.

I have never seen a cure result from the employment of magnets, although in three hysterical cases I have seen a shifting of the pruritus under their influence. But, what is of more importance, I have seen them several times cause itching in neuropathic subjects suffering from apruriginous scabies. The faradic current has been successfully used by various authors.

Treatment of Special Forms.

Winter Itch.—In a general way, as above remarked, the use of seasonable and suitable clothing is of great importance in the treatment of this special form of pruritus. The patients should never wear wool directly against the skin, using linen or silk in preference. Their garments should be loose and unconfining, and they should wear woolen garments outside their silk or linen underclothing in order to be well protected against sudden changes of temperature. They should wear soft kid gloves and over these gloves of wool or fur. They will often find it serviceable to improve the tone of their skin by taking Turkish baths followed by cold douches. If their circumstances will permit, they should always pass the winter season in a mild climate.

Pruritus Ani.—In addition to the general treatment of pruritus I advise patients suffering from pruritus ani to observe the strictest

attention to cleanliness, washing themselves carefully, immediately after having been to stool, by means of wads of absorbent cotton dipped in a warm infusion of camomile, or in simple water containing to each half-cupful a drop of creolin or a small quantity of a weak alcoholic solution of carbolic aid, of resorcin, of ichthyol, or the like.

These patients should pay special attention to the maintenance of a regular action of the bowels, to which end they may sometimes be obliged to resort to hot injections or to the passage into the rectum of a hollow metallic bulb into which water, as hot as possible, is introduced. Suppositories may render great service in these cases. Those which I most frequently employ are the following:

Boric acid,	0.01
Iodoform,	0.01 to 0.05
Cacao butter,	q. s.
Boric acid,	0.01 to 0.05
Ichthyol,	0.01 to 0.05
Extract of belladonna,	0.01 to 0.03
Cacao butter,	q. s.
Extract of belladonna,	0.01 to 0.03
Borax,	0.02 to 0.04
Tannin,	0.02 to 0.05
Cacao butter,	q. s.
Powdered benzoin,	
Borax,	ää 0.02 to 0.04
Cacao butter,	q. s.
Tar,	
Borax,	ää 0.02
Cacao butter,	q. s.

The proportions of the ingredients above mentioned may be varied to suit the indications in special cases.

The lotions made with an alcoholic solution of tar in a warm infusion are often very useful. In inveterate cases I have had recourse with a measure of success to electrolysis.

Unna recommends in rebellious cases the superficial application of the thermo-cautery, the patient being anæsthetized. Vidal has employed scarifications. Following operations of this nature antiseptic salves or pastes should be applied.

We may sometimes make use of the menthol crayon or the application of a solution of nitrate of silver.

Pruritus Vulvæ.—The first thing to do is to treat any affection of the genito-urinary organs which may be the cause of the pruritus. Vaginal or uterine discharges should be treated by means of vaginal injections or by tampons impregnated with suitable remedies. In-

jections of a hot infusion of camomile to which a little creolin or carbolic acid has been added are often of service. I frequently prescribe tampons coated with an ointment of boric acid, salol, ichthyol, or resorcin, in vaseline.

After the application of a suitable lotion the vulva should be dusted with one of the above powders mentioned and an occlusive dressing may be made by means of one of the salves or pastes, of which the formula has been given, care being taken to interpose the dressing between the lips of the vulva. Finally, we may also resort to any of the methods recommended in the section on pruritus ani or in that on pruritus in general.

Pruritus of the External Male Genitals.—The recommendations contained in the sections on pruritus in general, pruritus ani, and pruritus vulvæ, are equally applicable to these cases.

Anæsthesia.

The treatment of anæsthesia consists above all in attention to the morbid condition of which it is the indicating dermatoneurosis or which it complicates. Later we may have recourse to cutaneous revulsives and especially to electricity. It is in these cases that local faradization, according to Vulpian's method, may be of very real service. During my term of service as interne under Vulpian I saw him restore cutaneous sensibility several times, not only in hysterical subjects, but also in patients whose anæsthesia was due to a lesion of the central nervous system. Effluvation or the application of continuous currents may be employed here in special cases.

Finally we may resort to metallotherapy, after Brocq's method, to magnets, or to the tuning-fork. In the hemianæsthesia of hysterical subjects these last-named methods, especially that of the magnet, may cause a transference of the anæsthesia.

Vascular Dermatoneuroses.

The treatment of the vascular dermatoneuroses is one of great difficulty and demands the most careful study of the case, by reason of the complex nature of the pathogenesis of these affections. In a general way we must be guided in our therapeutic measures by the facts which we can gather concerning the etiology.

When the etiological diagnosis has been determined we must then endeavor to combat and to remove, if possible, by means of an appropriate therapy, the alteration or disease of the central or peripheral nervous system, upon which these vasomotor perturbations depend. But in many cases this alteration or disturbance of function

in the nervous system is itself secondary to other perturbations which it will be our duty to search for with the greatest care (for example, reflex vasomotor dermatoneuroses secondary to various visceral affections or to various forms of poisoning or auto-intoxications). But, as has been noted above, we often observe a susceptibility or a special nervous irritability which plays at least the rôle of predisposing cause in many of these patients. It is this susceptibility, this irritability, this nervous weakness, if you will, which we must also combat by the rational employment of nerve tonics and sedatives.

The cutaneous manifestations of the disturbance of the vasomotor nervous system must be combated by internal and local remedies.

In certain cases methodical counter-irritation made over the affected portions of the nervous system may give good results. It was with this aim that Chapman advised many years ago the application at various points along the spinal column of hot water, or of ice, or of the two alternately, in order to modify the vasomotor action of the spinal cord and of the great sympathetic. It is with the same end in view that the application of lotions or sprays of chloroform, ether, or chloride of methyl along the spinal column may be tried. More active counter-irritants which may be used in certain cases are tincture of iodine, blisters, and the actual cautery.

In other cases when an alterative action appears desirable we may apply over certain portions of the nervous centres various ointments, especially those containing belladonna and the iodide of potassium.

Hydrotherapy often gives good results. It may be used either in the form of cold douches, applied, however, with great caution, or, especially in irritable subjects, in the form of warm oblique douches, simple or sulphurated, applied along the back. Cold or warm baths are also frequently of service by reason of their tonic or sedative action upon the nervous system.

In certain cases we may have recourse to electricity, either the continued current or franklinism. This agent, however, should be used with great caution, for it may sometimes give results very different from those anticipated.

In the case of hysterical subjects we may use magnets or metallotherapy. In certain instances suggestion may be of service. We need not dwell at greater length upon this subject, since the treatment in these cases is that of hysteria in general.

The internal use of nerve tonics and sedatives is always of great utility. We have to combat the neurasthenia, which is so frequent in the subjects of dermographism, by means of an appropriate therapy, having special regard to aerotherapy, to mental distraction, to travel, and to moral, intellectual, and physical rest.

Among the remedies which will be found useful in these cases are strychnine, the hypophosphites, arsenic, sometimes coca or kola, in certain cases the glycerophosphates, and especially quinine. In addition, we may, according to special indications, prescribe ergotin, atropine, cannabis indica, salicylate of sodium, the bromides, and the valerianates. Antipyrin has never given me the least results, and neither has chloral.

The *local treatment* will always be found useful, although somewhat uncertain. In a general way, not only here but in the case of all dermatoneuroses, we must protect the skin, as far as possible, from all traumatism or irritation from external agents. Usually the application of inert powders or, if it should seem indicated, the covering of the part with some ointment, the formulæ for both of which have been given in the section on the treatment of pruritus, will give satisfactory results, especially if the applications have been made in the manner prescribed in that section. Quite frequently it will be found beneficial to precede the use of these powders or ointments by that of lotions, generally hot, or of infusions, the nature of which will vary according to the case (camomile, coca, green tea, etc.). To these infusions may be added, according to the special indication, a few drops of carbolic acid, thymic acid, creolin, menthol, naphthol, salicylate of sodium, borax, bicarbonate of sodium, acetate of lead, tannin, alcoholic solution of ergotin, of atropine, etc. We may even incorporate some of these just mentioned remedies with the ointments or with the water of the bath.

Raynaud's Disease.

Local asphyxia of the extremities seems in certain cases to be symptomatic of various affections, as we have seen in speaking of its etiology, and we must endeavor to discover and treat these primary affections, if present. By reason of the probable central origin, spinal in the majority of cases, of local asphyxia of the extremities, it will often be found useful to make counter-irritation along the spine by means of tincture of iodine, blisters, or even the actual cautery. I have frequently prescribed, but with variable success, hot oblique spinal douches, sulphurated or not. It has seemed to me in some cases that marked benefit was obtained by the application to the spine and along the course of the nerves leading to the affected parts of an ointment containing iodide of potassium, extract of belladonna, and opium in benzoinated lard.

Starting with the idea that stimulation of the spinal cord causes spasm of the arterioles, Maurice Raynaud advises the employment of

the continuous current, especially of the descending spinal current. For this purpose we may use twenty-five or thirty Daniel or Trouvé elements. The positive electrode is applied at the fifth cervical vertebra, the negative at the last lumbar vertebra or over the sacrum; at a later period the latter may be brought up to the level of the eighth dorsal vertebra. One séance, lasting from ten to fifteen minutes, may be given each day. If any signs of intolerance, such as headache, a feeling of constriction in the throat, or general nervous excitement appear, we reduce the number of elements and apply a centrifugal current along the affected limbs. In two cases of local asphyxia of the fingers I have resorted to the method of effluvation, as developed by me in collaboration with Professor Doumer, of Lille. I have not, however, observed any very beneficial effects from its employment.

It is often well to recommend patients suffering from local asphyxia of the extremities to rub the affected parts with some stimulating liquid, such as alcohol, Cologne water, or the like. Exposure of the affected parts to cold should be scrupulously avoided, and whenever the weather is cold the patients should constantly wear kid gloves, over which they may draw woolen or fur mittens. This serves also the purpose of protecting the skin from all external sources of irritation, a procedure which I advise in all dermatoneuroses of whatever nature.

For the relief of pain, when present, we may try the effect of calmative liniments, such as of chloroform, chloral, etc.

All ulcers, gangrenous patches, phlyctenæ, etc., should be dressed with suitable ointments, applied in a thick layer. To the ointments employed for this purpose I usually add a little extract of belladonna.

The *internal treatment* will vary much according to the special indications. I have had good results in different cases from the iodide or iodo-bromide of potassium, arsenic, quinine, belladonna, and the valerianates, as well as from the glycerophosphate of lime, cod-liver oil, and tonics.

Recently I have employed with apparent success injections of testicular juice after the Brown-Séquard method, but I have obtained no results whatever with thyroid extract.

NOTE.—In consequence of severe injuries received in a railway accident, while he was engaged in the preparation of this article, Professor Leloir was unable to complete the chapter on the Trophoneuroses; that part of the section on the pathogenesis of these affections which follows Acrodynia was therefore compiled, under his supervision, from his previous writings by two of his assistants.—EDITOR.

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INDEX TO VOLUME V.

Acanthia ciliata, 68
rotundata, 68
Acantholysis, 379
Acarus folliculorum, 54
hordei, 51
scabiei, 42, 46
Achorion Schönleinii, 106
Acne atrophica, 520
cornea, diagnosis of, from lichen scrofulosorum, 359
hypertrophica, 521
keloid, 521
mentagra, 438
necrotica, diagnosis of, from hidrosadenitis, 565
pilaris, diagnosis of, from hidrosadenitis, 565
rosacea, 516
diagnosis of, 185, 517, 722
sebacea (of the French writers), 488
simplex, 503
diagnosis of, 91, 185, 448, 506
etiology, 505
prognosis, 515
treatment, 506
treatment, local, 510
varioliformis (of Bazin), 708
vulgaris, 503, see *Acne simplex*
Acrochordon, 658
Acrodynia, 835
Acromegaly, the nails in, 628
Actinomycosis of the skin, 117
Adenoma sebaceum, 721
diagnosis of, 722
etiology, 721
pathology, 722
prognosis, 723
treatment, 723
Aden ulcers, 475
Aleppo boil, 461
Allen, Charles W., on the Anatomy of the Skin, 1
Allochiria, 779
Alopecia, 581.
areata, 589
definition, 589
diagnosis, 593
due to a vegetable parasite, 120
etiology, 590, 850
pathological anatomy, 593
symptoms, 589
treatment, 594
congenita, 575
eczematosa, 584
from favus, 103
from folliculitis, 587
from nutritive changes in the skin, 589
from tinea tonsurans, 75
in acute infectious disease, 586
in leprosy, 587
in myxœdema, 587
in syphilis, 586
pityrodes, 584
premature, 583
seborrhœic, 484, 584
senile, 583
traumatic, 582
Alphos (E. Wilson), 265
Ambustio, 243
Anæmia, cutaneous, 798
Anæsthesia, cutaneous, 775
painful, 776
treatment, 878
Analgesia, 776
Anatomy of the Skin, 3
the skin proper, 3; glandular structures, 11; vascular system, 13; muscles, 15; pigmentation, 15; nerves, 16; hair, 17; nails, 20; bibliographical references, 21

Angiokeratoma, 688
Angioma, 671
infective, 681
serpiginosum, 681
treatment, 675
Angioneuroses of the skin, 784
Anidrosis, 557
Antipyrin, rash caused by, 237
Anus, eczema of the, 216
pruritus of the, 772
Apes (bees), 41
Aplasia pilorum moniliformis vel intermittens, 607
Araneina, 41
Area Celsi, 589
Argas chinche, 64
persicus, 64
Argyria, discoloration of the nails in, 618
Army itch, 44
Arsenic, rash caused by, 238
Asiatic pill, 274, 320
Aspergillus glaucus, 114
niger, 114
Asphyxia, local, of the extremities, 800
Asteatosis, 497
Atrichia congenita, 575
localis, 577

Baldness, 581, see *Alopecia*
Barber's itch, 88, 438
Beard, ringworm of the, 88
Bedbug-bites, 37
Bedsores, 844
Bee-stings, 41
Belladonna, rash caused by, 238
Bilharzia hæmatobia, 60
Bird mite, 40
Biskra button, 461
Black head in comedo, source of the color in, 544
Blepharitis, 210
Bloody sweat, 552, 813
Blow fly, 68
Blushing, 135
emotional, 790
Boils, 457
oriental, 461
Bot-flies, 60
Bowditch Island ringworm, 96
Bowen, John T., on Benign Neoplasms of the Skin, 629
Breast, eczema of the, 224
hysterical, 828
Brocq, L., on Papular Affections of the Skin, 295
Bromidrosis, 536
Bromine and its compounds, rash caused by, 238
Burns of the skin, 243
three degrees of, 244
Bulkley, L. Duncan, on Parasitic Diseases of the Skin, 25
Bullous Affections of the Skin, 365
pemphigus, 365; pemphigus vulgaris, 366; pemphigus foliaceus, 378; hydroa, 385; hydroa vacciniforme, 386; dermatitis herpetiformis, 389; pompholyx, 405; bibliographical references, 410

Calliphora vomitoria, 68
Calvities or calvitium, 582
Cancer, occurring in cicatrices, 644
spider, 672, 674
Canities, 596
acquired, 597
congenital, 597
etiology of, 850
Carate, 116
Carbuncle, diagnosis of, from furuncle, 459
from tinea kerion, 81
Carcinoma seborrhœicum, 486
Cascadöe, 96
Casein ointment, 875
Caterpillars, stings of, 42
Causalgia, 761
Celsi area, 589
Cheiropompholyx, 405
Cheloid, 646, see *Keloid*
Chilblain, 144, 249
diagnosis of, from eczema, 223
from lupus erythematosus, 249
Chloasma (of the older writers), 97
diagnosis of, from erythrasma, 113
from tinea versicolor, 100
Chloral, rash caused by, 240
Chromidrosis, 539
black, 539
blue, 539
course and duration, 543
diagnosis, 544
etiology, 543

Chromidrosis, green, 545
red, 546
symptoms, 542
treatment, 545, 549
yellow, 545
Chromophytosis, 97
Cicatrix, 639
atrophic, 639
cancer occurring in, 644
deformities produced by, 642
diagnostic significance of, 641
flat, 639
hypertrophic, 639
locomotion of, 643
normal, 639
treatment, 644
Cicatrization, process of, 640
Cimex lectularius, 37
Cinchona and its alkaloids, rash caused by, 243
Clastothrix, 610
Cleavage lines of the skin, 5
Clegg, 63
Coil glands, diseases of the, 525
Cold, action of, upon the skin, 144, 249
Colloid milium, diagnosis of, from adenoma sebaceum, 722
Combustio, 248
Comedo, 498
double, 498
mite, 53
source of color of the "black head" in, 544
treatment, 499
Compsomya macellaria, 63
Congelatio, 248
Conorhinus nigrovarius, 64
Copaiba, rash caused by, 240
Corium, 5, 7
papillary layer of the, 8
reticular layer of the, 9
Crab-louse, 35
Craw-craw, 57
CROCKER, H. RADCLIFFE, on Phlegmonous and Ulcerative Affections of the Skin, 455
on Squamous Affections of the Skin, 263
Cucumber ointment, 211
Culex anxifer, C. pipiens, 41
Culicidæ, 41
Cuniculus in scabies, 43, 45
Cute, 116
Cuticle of the hair, 18
Cuticula, 5, 7
Cutis anserina, 15, 780
laxa, 657
vera, 5, 7
Cystadenoma, benign epithelial, 718
Cysticercus cellulosæ, 58
Cysts of the sweat glands, 560
sebaceous, 502

DECUBITUS, 844
Delhi boil, 461
Demodex folliculorum, 53, 498
Depilatio, see *Alopecia*
Depilatories, 579
Derma, 5, 7
papillary layer of the, 8
reticular layer of the, 9
Dermanyssus avium, 40
gallinæ, 40
Dermatalgia, 759
treatment, 865
Dermatitis, 232
ambustionis, 248
calorica, 248
congelationis, 248
contusiformis, 156
diagnosis of, from eczema, 186
exfoliativa, 280, 842
epidemica, 257, 284
gangrænosa adultorum, 468
infantum, 437, 466
multiplex, 466
herpetiformis, 389
bullous, 394
definition, 390
diagnosis, 399
from eczema, 400
from erythema multiforme, 154, 400
from herpes zoster, 401
from impetigo herpetiformis, 431
from pemphigus, 381, 399
from urticaria, 401
erythematous, 391
etiology, 397
morbid anatomy, 399
multiform, 396

Dermatitis herpetiformis, papular, 392
pathology, 397
prognosis, 401
pustular, 395
special types, 391
symptoms, 390
synonyms, 389
treatment, 402
vesicular, 393
medicamentosa, 235
papillaris capillitii, 521
repens (Crocker), 255
seborrhœic psoriasiform, 271
traumatica, 232
venenata, 232
Dermatobia, 61
Dermatolysis, 657
Dermatomycosis furfuracea, 97
trichophytina, 66
Dermatoneuroses, 745
classification, 749; sensory dermatoneuroses, 754; increased cutaneous sensibility, 758; abolition of cutaneous sensibility, 775; perversions of cutaneous sensibility, 779; vascular dermatoneuroses, 782; hyperæmic, 784; anæmic, 798; hemorrhagic, 807; urticaria, 816; œdematous dermatoneuroses, 825; trophic dermatoneuroses, 832; trophoneurotic erythema, 833; glossy skin, 834; acrodynic erythema, 835; vesicular eruptions, 836; bullous eruptions, 840; pustular eruptions, 842; ulcerations, 843; gangrene, 844; scleroderma, 845; ichthyosis, 846; pigmentary affections, 847; affections of the appendages of the skin, 849; nervous changes concerned in the production of dermatoneuroses, 851; treatment, 861; bibliographical references, 882
Dermatoneuroses, anæmic, 798
classification of, 749
congestive, 784
cum materia, 851, 852
glandular, 753, 850
hemorrhagic, 807
caused by mental shock, 810
etiology, 815
neuropathic, 810
Dermatoneuroses, hyperæmic, 784
indicator, 769, 861
ischæmic, 798
motor, 750, 780
nervous changes concerned in the production of, 851
œdematous, 824
sensory, 749, 754
treatment, 865
sine materia, 852, 857
treatment, 861
trophic, 750, 832
vascular, 750, 782
treatment, 878
vasodilator, 785
vesicular, 836
Dermographism, 817
relation of, to emotional erythema, 792
Diabetes mellitus, eczema complicating, 182, 214
gangrene of the skin complicating, 468
xanthoma in, 666
Diachylon ointment, 200
Distoma hæmatobium, 60
hepaticum, 59
Dracontiasis, 55
Dracunculus medinensis, 54
Drug eruptions, 235
Dye, hair, 598
Dysæsthesia, cutaneous, 779
Dysidrosis, 405

Ears, eczema of the, 209
fungous disease of the external auditory canal, 118
pruritus of the, 774
Ecchymoses, neurotic, 807, see *Dermatoneuroses, hemorrhagic*
Echinococcus cutis, 59
Ecthyma, 433
clinical course, 433
diagnosis, 435
from impetigo contagiosa, 423, 436
from impetigo simplex, 417, 435
from syphilis, 436
etiology, 434, 842
infantile gangrænosum, 437
morbid anatomy, 435

Ecthyma of nervous origin, 842
pathology, 435
prognosis, 436
térébrant, 437, 466
treatment, 436
Eczema, 169
acute, 183
treatment of, 198
altered secretion of sweat in, 558
anal, 216
Eczema and Dermatitis, 169
eczema, 169; etiology, 169; pathology, 172; primary types, 174; diagnosis, 185; prognosis, 191; treatment, 192; local varieties, 205; *dermatitis*, 232; d. traumatica, 232; d. venenata, 232; d. medicamentosa, 235; d. calorica, 243; congelatio, 248; feigned diseases of the skin, 252; dermatitis repens, 255; dermatitis exfoliativa epidemica, 257; bibliography, 258
Eczema capillitii, 205
capitis, 205
chronic, 184
treatment, 201
circinate seborrhœic, 488
circumscriptum, 228
diabeticorum, 182, 214
diagnosis, 185
from acne, 185
from acne rosacea, 185
from chilblains, 228
from dermatitis, 186
from dermatitis herpetiformis, 400
from erysipelas, 186
from erythema, 186
from erythema intertrigo, 133
from erythema multiforme, 154
from herpes, 186
from impetigo, 186
from impetigo contagiosa, 423
from impetigo simplex, 417
from keratosis of the palms and soles, 221
from lichen planus, 187
from lichen ruber, 187
from lichen scrofulosorum, 360
from lupus erythematosus, 187, 708
Eczema, diagnosis from lupus vulgaris, 187
from Paget's disease of the nipple, 225
from pediculosis, 31, 34, 37, 187
from pemphigus, 188, 381, 382
from pityriasis ruber, 188, 286
from pityriasis ruber pilaris, 188
from pompholyx, 408
from prurigo, 188, 332
from pruritus, 188
from psoriasis, 188, 270
from rosacea, 185
from scabies, 46, 189
from scarlatina, 189
from seborrhœa, 189, 489
from sycosis, 189, 213, 445
from syphilis, 190
from tinea favosa, 108, 191
from tinea trichophytina, 69, 71, 80, 91, 94, 190
from tinea versicolor, 100, 191
from urticaria, 191
epidemic, 257, 284
erythematosum, 174
etiology, 169
fissum, 188
gouty, 170, 215
impetiginodes, 177
infantile, 185, 230
intertrigo, 182, 226
labial, 212
madidans, 179
marginatum, 70, 181, 227
narium, 210
neuriticum or neuroticum, 181, 889
of the anus and anal region, 216
of the beard, 213
of the breasts, 224
of the ears, 209
of the extremities, 218
of the eyelids, 210
of the face, 207
of the feet, 221
of the genital region, 218
of the hands, 221
of the lips, 212
of the mamma, 224
of the nails, 224
of the nipples, 224
of the nostrils, 210

Eczema of the scalp, 205
of the umbilicus, 227
papulosum, 175
parasiticum, 180, 227
pathology, 179
primary types of, 174
prognosis of, 191
pustulosum, 177
rhagadiforme, 188
rubrum, 179
seborrhœicum, 178, 228
capitis, 205, 482
capitis, alopecia with, 584
sclerosum, 188
secondary forms of, 178
solare, 244
squamosum, 178
symptoms, 174
synonyms, 169
treatment, 192
external, 197
hygienic, 193
internal, 194
of acute, 198
of chronic, 201
of local varieties of, 205
tropical, 229
universal, 229
verrucosum, 188
vesiculosum, 176
Effluvation, electricity administered by, 863
Electrolysis, epilation by, 577
for nævi, 677
Ephelides, diagnosis of, from xeroderma pigmentosum, 740
Ephidrosis, 525
Epidemic skin disease, 257, 284
Epidermis, 5
Epidermolysis bullosa hereditaria, 876
Epilation by electrolysis, 577
for favus, 109
for hypertrichosis, 579
for sycosis, 451
in tinea capitis, 88
forceps for, 84
sticks for, 109
Epilepsy, shedding of the nails in, 624
Epithelioma adenoides cysticum, 718
multiple benign cystic, 718
Epithelioma adenoides cysticum, diagnosis of, from adenoma sebaceum, 723
Eponychium, 21
Erysipelas, altered secretion of sweat in, 558
diagnosis of, from eczema, 186
from lymphangioma circumscriptum, 687
Erythema, 127
acrodynic, 885
annulatum, 147
bibliographical references, 165
bullosum, 148
caloricum, 131
centrifugum, of Biett, 691
circinatum, 147
desquamative scarlatiniform, 137
diagnosis of, from eczema, 186
emotional, relation of, to dermographism, 792
exudativum multiforme (Hebra), 143
complications, 151
course and duration, 151
definition, 146
diagnosis of, 154, 186, 881
etiology, 152
morbid anatomy, 153
pathology, 152
prognosis, 155
symptoms, 146
treatment, 155
figuratum, 147
fugax, 136
gyratum, 147
hyperæmic, 128
idiopathic, 130
induratum, 160
diagnosis, 159, 161
treatment, 161
inflammatory, 143
intertrigo, 130, 132, 182
diagnosis of, 133
iracundiæ, 135
iris, 147
læve, 135
lupinosum, 691
marginatum, 148
multiforme, 145
diagnosis of, from dermatitis herpetiformis, 400

Erythema neonatorum, 130
nodosum, 156
diagnosis, 159, 161
etiology, 157
morbid anatomy, 158
pathology, 158
prognosis, 159
symptoms, 157
synonyms, 156
treatment, 159
of nervous origin, 786
papulatum, 147
diagnosis of, from prurigo simplex, 342
paratrimma, 130
pernio, 144, 249
polymorphe, 143
pudicitiæ, 135
roseola, 135
scarlatiniforme, 136
definition, 137
diagnosis, 142
etiology, 140
pathology, 141
prognosis, 143
symptoms, 137
treatment, 143
scarlatinoid, 136
simplex, 128
solare, 132, 244
symptomatic, 135
traumatic, 130
trophoneurotic, 833
tuberculatum, 147
urticatum, 148
Erythematous Affections, 127
hyperæmic erythema, 128; idiopathic erythema, 130; symptomatic erythema, 135; inflammatory erythema, 143; bibliographical references, 165
Erythrasma, 112
diagnosis of, 101, 113
pathology, 112
treatment, 113
Erythrodermie exfoliante, 280
Erythromelalgia, 789
Eyelids, eczema of the, 210
xanthoma of the, 662

Face, eczema of the, 207
Face, pityriasis rubra pilaris of the, 347
Fat, secretion of, by the coil glands of the skin, 12
Fat-neck, 660
Favi, 102
Favus, 102
of the epidermis, 104
of the nails, 105
of the scalp, 102
Favus-cups, 102
Feet, eczema of the, 221
pityriasis rubra pilaris of the, 348
Fibroma molluscum, 658
diagnosis, 659
prognosis, 659
treatment, 659
Fibroma of the skin, 658
diagnosis of, from molluscum contagiosum, 713
Filaria medinensis, 54
of craw-craw, 57
sanguinis hominis, 56
Flea, 38
sand, 52
Flea-bites, 39
Flesh-fly, 63
Flies, larvæ of, in wounds, 63
Fluke, liver, 59
Fluxus sebaceus, 483
Folliculitis, alopecia caused by, 587
exulcerans, diagnosis of, from hidrosadenitis, 565
purulent, 588
Foot, fungous, of India, 119
Fowl mite, 40
Fragilitas crinium, 601
Framboesia syphilitica, 369
Freckles, diagnosis of, from xeroderma pigmentosum, 740
Frost-bite, 248
Furuncle, 457
description and course, 457
diagnosis from, 459, 568
etiology, 458
oriental, 461
pathology, 458
sweat, 566
treatment, 459
Furunculus orientalis, 461
bibliography, 465
definition, 461

Furunculus orientalis, diagnosis, 463
etiology, 463
pathology, 464
prognosis, 464
symptoms, 461
synonyms, 461
treatment, 464

Gafsa button, 461
Galeodes araneoides, 64
Gangrene, 465, 820, 844
bibliography, 474
hysterical, 472
spontaneous, 472
symmetrical, of the extremities, 800
Gelatins, medicated, 199
Genitalia, eczema of the, 213
Giovannini's disease, 605
Glands, coil, 11
coil, diseases of the, 525
of the skin, Moll's, 12
Zeiss', 12
racemose, of the skin, 11
sebaceous, 11
diseases of the, 481
trophic lesions of the, 850
sweat, 11
diseases of the, 525
Glossodynia, 774
Glossy skin, 834
Glove, epidermic, 138
Glycerin jellies, medicated, 199
Glycosuria, eczema complicating, 182
gangrene of the skin in, 468
xanthoma in, 666
Gnat, creeping, 63
Gnats, bites of, 41
Gonorrhœa, shedding of the nails in, 625
Goose-flesh, 15, 780
Granulations, 640
Gray hair, 596
Guinea-worm, 54
Gumma, diagnosis of, from erythema induratum, 161
Gum, red, 559
Gune, 96

Hæmatidrosis, 552, 813
Hæmotopota pluvialis, 63
Hair, anatomy of the, 17, 573
Hair and Nails, Diseases of the, 573
the hair, 573; hygiene of the hair and scalp, 573; twin or triplet hairs, 575; hypotrichosis congenita, 575; hypertrichosis, 577; atrophy, 581; alopecia, 581; canities, 596; fragilitas crinium, 601; nodular disease, 602; plica, 614; *the nails*, 615; hygiene of the nails, 616; congenital affections, 617; traumatism, 617; discoloration, 618; onychauxis, 619; onychatrophia, 620; affections of the nails in diseases of the nervous system, 621; in syphilis, 624; in gonorrhœa, 625; scleronychia, 625; leucopathia unguium, 626; bibliography, 626
Hair, atrophy of the, 581
beaded, 607
cuticle of the, 18
follicle of the, 18
gray, 596
Hodara's disease of the, 613
hygiene of the, 573
hypertrophy of the, 577
infiltrated with achorion Schönleinii, 107
with trichophyton, 79, 80, 90
loss of the, 581
moniliform, 607
nervous affections of the, 850
nodose, 607
nodular diseases of the, 602
papilla of the, 19
Quinquaud's disease of the, 588
ringed, 600
root sheath of the, 19
temporary change of color of the, 601
twin or triplet, 575
Hands, eczema of the, 221
pityriasis rubra pilaris of the, 348
Harvest bug, 50
Headache following wounds of the scalp, 643
Heat, action of, upon the skin, 131, 243
Hemorrhages, cutaneous, 807, see *Dermatoneuroses, hemorrhagic*
Hemorrhoidal abscess, 567
Herpes, 836
altered secretion of sweat in, 558
circinatus, 67, 148
bullosus, 389

Herpes desquamans, 96
diagnosis of, from eczema, 186
gestationis, 389, 394, 398
iris, 148
diagnosis of, from erythema multiforme, 154, 381, 424
tonsurans, 73
maculosus, 290
vegetans, 369
zoster, 336
diagnosis of, from dermatitis herpetiformis, 401
Hidrocystoma (Robinson), 405
Hidrosadenitis, 563
diagnosis, 565
phlegmonous, 566
diagnosis, 568
treatment, 569
Hirsuties, 577
Hirudo, 42
Hodara's disease, 613
Honey disease, 176
Hydatid of tænia echinococcus, 59
of tænia solium, 58
Hyde, James Nevins, on Eczema and Dermatitis, 167
Hydradenoma, 718
Hydroa, 385
bullosum, 389
definition, 387
diagnosis, 388
etiology, 387
herpetiforme, 389
iodic, 241
pathology, 388
prognosis, 388
pruriginosum, 389
puerorum, 386
symptoms, 387
synonyms, 386
treatment, 389
vacciniforme, 386
diagnosis from hidrosadenitis, 565
Hydrocystoma, 560
Hyperæsthesia, cutaneous, 762
treatment, 865
Hyperidrosis, 525
etiology, 528
oily, of the scalp, 483
of the smooth parts, 486
Hyperidrosis, prognosis, 535
treatment, 532
Hypertrichosis, 577
Hypoderma bovis, 61
Hyponychium, 21
Hypotrichosis congenita, 575
circumscripta, 577
universalis, 576
Hysteria, hemorrhagic dermatoneuroses in, 810
Hysterical breast, 828

Ichthyosis, 846
altered secretion of sweat in, 558
Impetigo, 413
contagiosa, 418
bullosa, diagnosis, from pemphigus, 381
definition, 418
diagnosis, 417, 422, 436
etiology, 421
pathology, 423
prognosis, 424
symptoms, 419
treatment, 425
variations, 420
diagnosis of, from eczema, 186
eczematodes, 177
figurata, 178
herpetiformis, 425
course, 429
definition, 425
diagnosis, 431
duration, 429
etiology, 430
morbid anatomy, 430
mucous membranes in, 428
pathology, 430
prognosis, 432
symptoms, 427
treatment, 432
parasitaria, 422
pustular eczema formerly so designated, 177
scabida, 178
simplex, 414
definition, 414
diagnosis, 417, 423, 435
etiology, 416
morbid anatomy, 416
pathology, 416

Impetigo simplex, prognosis, 417
symptoms, 415
treatment, 417
Infants, acute pemphigus in, 371
eczema in, 185, 280
Intertrigo, 182
Iodine and its compounds, rash caused by, 240
Ischæmia, cutaneous, 798
Itch, 42
barber's, 88, 438
Dhobie's, 71
winter, 771
treatment, 876
Itching, 765, see *Pruritus*
Itch-mite, 42, 46
Ixodes, 39
albipictus, 39
bovis, 39
carapato, 64
monbate, 64
ricinus, 39

JAUNDICE, association of xanthoma with, 664
Jigger, 52

KANDAHAR sore, 461
KAPOSI, MORIZ, on Xeroderma Pigmentosum, 725
Keloid, 646
Addison's, 646
anatomy, 649
diagnosis, 650
false, 647
in plaques, 649
prognosis, 651
scar, 647
treatment, 651
true, 647
Keloidal sycosis of the nucha, 521
Keratosis of the palms and soles, 183
diagnosis of, from eczema, 223
Keratosis pilaris rubra, diagnosis of, from pityriasis rubra pilaris, 352
Kerion, 75

LABIOMYCOSIS, 116
Lafa Tokelau, 96
Lanugo, 20
Larvæ, dipterous, 62
Lassar paste, 199
Leech-bites, 42
Legs, eczema of the, 218
LELOIR, H., on Dermatoneuroses, 743
Lepothrix, 605
diagnosis of, from piedra, 604
from trichorrhexis nodosa, 612
Lepra alphos, 265
of Willan, 265
Leprosy, alopecia in, 587
diagnosis of, from xeroderma pigmentosum, 740
Leptothrix vaginalis, 115
Leptus autumnalis, 50
Leucoderma, diagnosis of, from tinea versicolor, 100
Leucopathia unguium, 626
Leucotrichia annularis, 600
Lichen annulatus serpiginosus, 484
corneus disseminatus, 318
diagnosis, 318
hyperkeratosis, 314
menti, 438
of Wilson, 306
papular eczema formerly wrongly so-called, 176
planus, 306
acutus, 308
annulatus, 307
atrophicus, 315
diagnosis of, 187, 271
marginatus, 308
polymorphe ferox, 324
Lichen ruber, 302
acuminatus, 303
acuminatus, diagnosis of, from pityriasis rubra, 287
acuminatus neuroticus, 314
acuminatus neuroticus, diagnosis of, 317, 354
acuminatus, treatment, 323
atrophicus, diagnosis of, 318
atrophicus, treatment, 324
corneus, treatment, 323
diagnosis of, from eczema, 187, 353
history, 302
moniliformis, 314
obtusus, 313
obtusus corneus, 313
obtusus corneus, diagnosis of, 318
obtusus, diagnosis, 317
obtusus, treatment, 323

Lichen ruber planus, 302, 306
complications, 310
corneous, 314
course, 311
diagnosis, 316
from lichenification, 316
etiology, 319
evolution, 310
localizations of, 308
objective varieties of, 313
pathogenesis, 319
pathological anatomy, 311
prognosis, 311
subjective phenomena, 309
symptoms, 306
treatment, 320
Lichen scrofulosorum, 356
diagnosis, 359
pathological anatomy, 358
prognosis, 357
symptoms, 356
treatment, 360
Lichen, significance of the term, 297
simplex acutus (of Vidal), 339
sparsus (of the older writers), 338
tropicus, 559
urticatus, 148
Lichenification, 300
associated with pruritus, 768
diagnosis of, from lichen ruber planus, 316
primary, 300
secondary, 300
Lipoma of the skin, 660
Lips, eczema of the, 212
seborrhœa of the, 497
Liquor picis alkalinus, 202
Liver fluke, 59
Locomotor ataxia, shedding of the nails in, 622
Louse, body, 32
crab, 35
head, 29
wood, 39
Lousiness, 29
Lukkeh sâl, 462
Lupus acneiformis, 691
Lupus erythematosus, 691
asphyxic form, 696
diagnosis, 702
Lupus erythematosus, diagnosis from chilblain, 144, 249, 703
from eczema, 187, 703
from hydroa, 388
from psoriasis, 703
from ringworm, 69, 703
from sycosis, 447
from syphilis, 703
discoid form, 694
disseminated form, 694
distinct from lupus vulgaris, 701
etiology, 700
exanthematoid form, 695
follicular type, 695
pathology, 698
prognosis, 703
symptoms, 692
treatment, 703
vascular type, 695
Lupus seborrhagicus, 691
vulgaris, diagnosis of, from eczema, 187
diagnosis of, from hydroa, 388
diagnosis of, from sycosis, 447
distinct from lupus erythematosus, 701
Lymphangiectasis, 683
Lymphangioma, 684
cavernous, 686
circumscriptum, 686
anatomy, 689
diagnosis, 690
etiology, 688
prognosis, 690
treatment, 690
cystic, 686
simple, 685

Madura foot, 119
Malabar ulcers, 475
Malingerers, diseases of the skin in, 252
Mamma, eczema of the, 224
Measles, diagnosis of, from erythema scarlatiniforme, 142
Mellitagra, 176
Meningitic streaks, 787
Mentagra, 89, 438
Merkel's touch cells, 17
Miana bug, 64
Micro-organisms, diseases of the skin due to, 121

Microsporon anomœon, 292
Audouini, 78
discovery of, by Gruby, 592
furfur, 99
minutissimum, 112
Midges, bites of, 41
Miliaria, 559
crystallina, 560
papulosa, 559
rubra, 559
vesiculosa, 559
Miliary fever, 560
Milium, 500
diagnosis of, from molluscum contagiosum, 713
Mites, bird and fowl, 40
Moll, glands of, 12
Molluscum contagiosum, 708
diagnosis, 713
etiology, 710
pathology, 711
prognosis, 714
treatment, 714
fibrosum, simplex, or pendulum, 653
giganteum, 709
sebaceum, 708
sessile, 708
verrucosum, 708
Monilethrix, 607
diagnosis of, from piedra, 604
from trichorrhexis nodosa, 609, 612
Montgomery, Douglass W., on Diseases of the Hair and Nails, 571
Morbus pedicularis, 29
Morphine, rash caused by, 242
Mosquito-bites, 41
Muguet, 116
Musca domestica, 63
Muscidæ, 63
Muscles, arrectores pilorum, 15
Mycetoma, 119
Mycomyringitis, 113
Myoma, dartoic, 668
simple, of the skin, 668
Myringomycosis, 113
Myxœdema, alopecia in, 587
the nails in, 623

Nævus araneus, 672, 674
flammeus, 672
Nævus lupus, 681
pilosus, altered secretion of sweat in, 557
treatment, 675
vasculosus, 672
altered secretion of sweat in, 557
Nails, anatomy of the, 20, 615
congenital affections of the, 617
discoloration of the, in argyria, 618
eczema of the, 224
favus of the, 105
groove of the, 20
hygiene of the, 616
lunula, 20
matrix, 20
nervous affections of the, 849
pityriasis rubra pilaris of the, 348
ringworm of the, 92
root of the, 20
thickening of the, 625
traumatism of the, 617
trophic disturbances of the, 621
white spots in the, 626
winged, 620
Natal sore, 461
Neoplasms, benign, of the skin, 631
Nerves of the skin, 16
peripheral dermatoneuroses dependent upon lesions of the, 854
wounds of, dermatalgia after, 760
Nervous diseases, affections of the nails in, 621
affections of the skin in, 745
Nettle rash, 816, see *Urticaria*
Neurasthenia, hemorrhagic dermatoneuroses in, 810
Neuritis, dermatoneuroses dependent upon, 854
multiple, shedding of the nails in, 622
Neuroma of the skin, 661
painful, of the skin, 661
Nipple, eczema of the, 224
Paget's disease of the, diagnosis of, from eczema, 225
Nose, pruritus of the, 774
Nostrils, eczema of the, 210

Œdema, angioneurotic, 827
cutaneous, 824

Œdema, localized cutaneous, 816
neonatorum, diagnosis of, from congelatio, 251
Œstridæ, 60
Oily crusts of the smooth parts, 485
Oily hyperidrosis of the scalp, 488
of the smooth parts, 486
Oligotrichia congenita, 575
Onychauxis, 619
Onychatrophia, 620
Onychogryphosis, 619
Onychomycosis, 92
Onychophagia, 618
Onyxis, general, diagnosis of, from ringworm of the nail, 94
Ophiasis, 582
Opium and its alkaloids, rash caused by, 242
Oriental boil, 461
Otitis externa parasitica, 113
Otomycosis, 113

Paget's disease of the nipple, diagnosis of, from eczema, 225
Pain in the skin, 758
Panniculus adiposus of the skin, 10
Papilloma of the skin, 631
Papular Affections of the Skin, 297
the lichens, 297; lichen ruber, 302; the prurigos, 324; prurigo of Hebra, 326; diathetic prurigo, 336; prurigo ferox, 337; prurigo simplex, 338; pityriasis rubra pilaris, 343; lichen scrofulosorum, 356; bibliographical references, 361
Paralysis, growth of the nails in, 621
Parasites, cutaneous, 27
animal, 29
microbic, 121
vegetable, 64
Parasitic Diseases of the Skin, 27
animal parasitic diseases, 29; pediculi, 29; cimex lectularius, 37; pulex irritans, 38; ixodes, 39; dermanyssus avium and gallinæ, 40; culicidæ, simulidæ, tabanidæ, 41; apes, vespidæ, araneina, 41; hirudo, 42; scabies, 42; leptus autumnalis, 50; pulex penetrans, 52; demodex folliculorum, 53; dracunculus medinensis, 54; filaria sanguinis hominis, 56; craw-craw, 57; cysticercus cellulosæ, 58; echinococcus cutis, 59; distoma hepaticum, 59; Bilharzia hæmatobia, 60; œstridæ, 60; muscidæ, 63; bibliography, 64; *vegetable parasitic diseases*, 64; tinea trichophytina, 66; tinea imbricata, 96; tinea versicolor, 97; tinea favosa, 102; erythrasma, 112; myringomycosis, 113; vaginomycosis, 115; labiomycosis, 116; pinta disease, 116; actinomycosis, 117; mycetoma, 119; alopecia areata, 120; bibliography, 120; *microparasitic diseases*, 121; bibliography, 124
Pediculosis, 29
capitis, 29
corporis, 32
diagnosis, 31, 34, 37
from eczema, 187
pubis, 35
synonyms, 29
treatment, 31, 35, 37
Pediculus capitis, 29
corporis, 32
pubis, 35
vestimentorum, 32
Peliosis rheumatica (Schönlein), 161, 815
Pemphigus, 365
acutus, 370
contagiosus neonatorum, 372
neonatorum, 371
arthriticus, 389
circinatus, 369, 389
croupous, 368
definition, 365
diagnosis, 380
from dermatitis herpetiformis, 381, 399
from eczema, 188, 381, 382
from erythema exudativum multiforme, 381
from herpes iris, 381
from impetigo contagiosa, 381, 424
from impetigo herpetiformis, 431
from pityriasis rubra, 286, 382
from psoriasis, 382
from syphilis, 381
from urticaria, 381

Pemphigus, diagnosis from varicella, 381
diphtheriticus, 368
epidemic, in infants, 372
etiology, 376
foliaceus, 373
gangrænosus, 368, 466
gyratus, 369
hæmorrhagicus, 367, 368
leprosus, 369
localis, 368
morbid anatomy, 380
mucous membranes in, 375
of nervous origin, 840
pathology, 378
prognosis, 382
pruriginosus, 368, 389
serpiginosus, 369
solitarius, 368
symptoms, 366
syphiliticus, 369
treatment, 383
vegetans, 369
vulgaris, 366
Pendjeh sore, 461
Penicillium pruriosum, 115
Perionychium, 21
Perlèche, la, 116
Pernio, 249
diagnosis of, from eczema, 228
from lupus erythematosus, 249, 703
Phagedæna tropica, 475
Phlegmonous and Ulcerative Affections of the Skin, 457
furunculus, 457; furunculus orientalis, 461; gangrene of the skin, 465; dermatitis gangrænosa multiplex, 466; spontaneous gangrene, hysterical gangrene, zoster atypicus gangrænosus et hystericus, 472; bibliography, 474; phagedæna tropica, 475; bibliography, 478
Phosphoridrosis, 551
Phthiriasis, 29, see *Pediculosis*
Phthirius inguinalis, 35
Piedra, 602
Piles, itching, an anal eczema, 216
Pili annulati, 600
Pinta disease, 116
Pita, 96
Pityriasis capillitii, 482
Pityriasis capitis, 205
alopecia with, 584
diagnosis of, from tinea tricho phytina capitis, 80
maculata et circinata, 290
pilaris, 343
Pityriasis rosea, 290
bibliography, 293
definition, 290
description and course, 290
diagnosis of, 100, 271, 292
etiology, 291
pathology, 291
prognosis, 293
synonyms, 290
treatment, 293
Pityriasis rubra, 280
bibliography, 287
definition, 280
description and course, 281
diagnosis, 286
from eczema, 188, 286
from erythema scarlatiniforme, 142
from pemphigus, 286, 382
from pityriasis rubra pilaris, 287, 353
from psoriasis, 271, 286
epidemic form of, 284
etiology, 285
Hebra's type of, 283
in children, 285
pathology, 286
prognosis, 287
synonyms, 280
treatment, 287
Pityriasis rubra pilaris, 343
course, 349
diagnosis, 188, 287, 351
duration, 349
etiology, 351
history, 343
of the face, 347
of the hands and feet, 348
of the nails, 348
of the scalp, 348
pathognomonic features, 346
pathological anatomy, 350
prognosis, 350
subjective phenomena, 349
symptoms, 345

Pityriasis rubra pilaris, termination, 349
treatment, 354
Pityriasis simplex, 485
versicolor, 97
Plica, 614
Podelcoma, 119
Poison ivy, dermatitis caused by, 233
oak, dermatitis caused by, 233
Polytrichia, 577
Pompholyx, 405
definition, 405
diagnosis, 408
etiology, 407
morbid anatomy, 407
pathology, 407
prognosis, 409
symptoms, 405
treatment, 409
Porrigo contagiosa, 418
decalvans, 120
favosa, 102
larvalis, 177
Port-wine mark, 672
Potassium bromide, rash caused by, 238
iodide, rash caused by, 240
Prickle-cell layer of the epidermis, 7
Prickly heat, 559
Proud flesh, 641
Prurigo, 324
agria, 328
course, 328
diagnosis, 188, 332
diathetic (of Besnier), 336
du rouget, 51
duration, 328
etiology, 330
ferox (of Hebra), 328
(of Vidal), 337
formicans (of the older writers), 324
history, 324
mites, 324, 328
of Hebra, 326
papule of, 326, 329
partial, 328
pathogenesis, 330
pathological anatomy, 329
podicis, 772
prognosis, 328
senilis (of the older writers), 324
simplex, 338
diagnosis, 342
Prurigo simplex, etiology, 342
pathogenesis, 342
pathological anatomy, 342
subjective phenomena, 342
symptoms, 339
treatment, 343
summer, diagnosis of, from hidrosadenitis, 565, 567
symptoms, 326
temporaire autotoxique (of Tommasoli), 339
treatment, 333
Pruritus, 765
a precursor of an eruption on the skin, 755
of tuberculosis or other disease of the gastro-intestinal tract, 769
ani, 772
treatment, 876
diagnosis of, from eczema, 188
from pediculosis pubis, 87
from prurigo, 332
etiology, 769
generalis, 772
hiemalis, 771
treatment, 876
lingual, 774
narium, 774
nocturnal, 767
of the ears, 774
of the male genital organs, 773
treatment, 878
of the palms, 774
of the scalp, 775
of the soles, 774
reflex phenomena caused by, 766
senilis, 770
treatment, 866
varieties of, 770
vulvæ, 772
treatment, 877
Psoriasis, 265
altered secretion of sweat in, 558
bibliography, 279
circinata, 266
definition, 265
description and course, 265
diagnosis of, 270
from eczema, 188, 270
from erythema multiforme, 154

Psoriasis, diagnosis of, from lichen planus, 271
from lupus erythematosus, 703
from pemphigus, 382
from pityriasis rosea, 271, 292
from pityriasis rubra, 271, 286
from pityriasis rubra pilaris, 353
from psoriasiform seborrhœic dermatitis, 271
from ringworm, 69, 80, 94, 272
from seborrhœa, 488
from syphilis, 272
diffusa, 266
empyodes, 266
etiology, 267
guttata, 266
gyrata, 266
nummulata, 266
pathology, 269
prognosis, 272
punctata, 265
rupioides, 266
synonyms, 265
treatment, 273
internal, 273
local, 276
Pulex irritans, 88
penetrans, 52
Pulmonary osteo-arthropathy, hypertrophic, the nails in, 623
Purpura, altered secretion of sweat in, 558
etiology of certain forms of, 815
exanthematous, 815
myelopathic, 815
neurotic forms of, 815
rash resembling, caused by potassium iodide, 242
rheumatica, 161, 815
Pustular Affections of the Skin, 413
impetigo, 413; impetigo simplex, 414; impetigo contagiosa, 418; impetigo herpetiformis, 425; ecthyma, 433; sycosis, 438; bibliographical references, 452
Pyodermias, hybrid and pure, 413

Quirica, 116
Quinine, rash caused by, 243
Quinquaud's disease, 588
diagnosis of, from alopecia areata, 594

Ray fungus, 118
Raynaud's disease, 800
etiology, 807
prognosis, 805
symptoms, 802
treatment, 880
Red gum, 559
Rete Malpighii, 6
mucosum, 6
Rhagades in eczema, 183
Rheum, salt, 169
Rheumatism, dermatalgia in, 759
Rhinoscleroma, 714
anatomy, 716
diagnosis, 717
prognosis, 718
treatment, 718
Rhus toxicodendron, dermatitis caused by, 233
venenata, dermatitis caused by, 233
Ringed hair, 600
Ringworm, 66, see *Tinea trichophytina*
Bowditch Island, 96
Burmese, 71
Chinese, 71
chronic, 74
crusted, 102
disseminated, 74
Indian, 71
of the beard, 88
of the body, 67
of the crotch and axilla, 70
of the nail, 92
of the scalp, 73
Tokelau, 96
Rosacea, 674, see *Acne rosacea*
Roseola, emotional, 791
infantilis, 136
use of term, 135
Rötheln, diagnosis of, from erythema scarlatiniforme, 142
Rouget, 51
Rupia escharotica, 466

Saccharomyces albicans, 116
Salt rheum, 169
Sand flea, 52
Sarcoma, reticular angioplastic, 683
Sarcophaga carnaria, 63
Sarcopsylla, 52

Sarcoptes scabiei, 43, 46
communis, 50
Savill's disease, 257, 284
Scabies, 43
acarus of, 46
a multiform eczema, 181
cuniculus in, 43
diagnosis, 46
from eczema, 46, 189
from impetigo contagiosa, 423
from pediculosis pubis, 87
from pompholyx, 409
etiology, 44
norvegica, 44
pathology, 45
prognosis, 49
synonyms, 42
treatment, 47
Scalp, eczema of the, 205
favus of the, 102
hygiene of the, 578
oily hyperidrosis of the, 483
pityriasis rubra pilaris of the, 848
pruritus of the, 775
ringworm of the, 78
Scar-keloid, 647
Scarlatina, diagnosis of, from eczema, 189
from erythema scarlatiniforme, 142
Scars, 639, see *Cicatrix*
Sclerema neonatorum, diagnosis of, from congelatio, 251
Sclerodactylia preceded by local asphyxia, 806
the nails in, 623
Scleroderma, 845
diagnosis of, from lichen ruber, 818
from xeroderma pigmentosum, 740
of the digits, the nails in, 623
preceded by local asphyxia, 806
Scleronychia, 625
Screw-worm fly, 68
Scutula of favus, 102
Sebaceous cyst, 502
Sebaceous Glands, Diseases of the, 481
functional disorders, 481; seborrhœa, 481; asteatosis, 497; comedo, 498; milium, 500; sebaceous cyst, 502; *structural disorders*, 503; acne simplex, 503; acne rosacea, 517; acne atrophica, 520; acne hypertrophica, 521; acne keloid, 521
Sebaceous glands, trophic lesions of the, 850
Seborrhœa, 481
adiposa, 488
concreta of the hairy parts, 488
of the smooth parts, 485
congestiva (of Hebra), 696
corporis, 483, 485
diagnosis, 488
from eczema, 189, 489
from pityriasis rubra, 293
from psoriasis of the scalp, 488
etiology, 490
generalized dry, 485
of the hairy parts, 482
of the lips, 497
of the smooth parts, 485
oleosa of the hairy parts, 483
of the smooth parts, 486
sicca of the hairy parts, 482
of the smooth parts, 485
treatment, 491
Seroot fly, 68
Shock, mental, hemorrhagic dermatoneuroses caused by, 810
Simulidæ, 41
Simulium columbaczense, 41
molestum, 41
reptans, 68
Skin, actinomycosis of the, 117
alteration in the nails accompanying disease of the, 321
anæsthesia of the, 775
anatomy of the, 3
animal parasites of the, 29
appendages of the, 17
diseases of, 573, 849
Skin, Benign Neoplasms of the, 631
papilloma, 631; verruca, 632; cicatrix, 639; keloid, 646; fibroma, 653; fibroma molluscum, 653; lipoma, 660; neuroma, 661; xanthoma, 662; myoma, 668; angioma, 671; nævus vasculosus, 672; telangiectasis, 674; angioma serpiginosum, 681; angiokeratoma, 683; lymphangioma, 684; lymphangioma circumscriptum, 686;

lupus erythematosus, 691; molluscum contagiosum, 708; rhinoscleroma, 714; multiple benign cystic epithelioma, 718; adenoma sebaceum, 721
Skin, blood-vessels of the, 18
bronzed, 847
bullous affections of the, 365
nervous, 841
burns of the, 243
catarrhal inflammation of the, 172
color of the, 4, 15
columnæ adiposæ of the, 10
drug eruptions of the, 285
dysæsthesia of the, 779
eczematous affections of the, 169
elasticity of the, 4
end bulbs in the, 17
erythematous affections of the, 127
feigned diseases of the, 252
gangrene of the, 465, 820
glands of the, 11
diseases of the, 481, 525, 850
odoriferous, 11
sebaceous, 11
sudoriparous, 11
glossy, 834
hemorrhagic neuroses of the, 807
horny layer, 5
hyperæmia of the, 127
hyperæsthesia of the, 762
inflammation of the, 232
Kaposi's disease of the, 727
layers of the derma, 8
layers of the epidermis, 5
lichenification of the, 300
lines of cleavage of the, 5
lymphatic vessels of the, 14
Merkel's touch cells, 17
microparasitic diseases of the, 121
muscles of the, 15
neoplasms of the, benign, 631
nerves of the, 16
neuralgia of the, 758
neuroses of the, 745
œdema of the, 824
local, 816
panniculus adiposus, 10
papular affections of the, 297
parasitic diseases of the, 27
animal, 29
Skin, parasitic diseases of the, microbic, 121
vegetable, 64
phlegmonous and ulcerative affections of the, 457
pigmentary affections of the, 847
pigmentation of the, 4, 15
poisoning of the, 235
pustular affections of the, 413
nervous, 842
Savill's disease of the, 257, 284
squamous affections of the, 265
subdermic connective tissue, 9
surface characteristics of the, 4
tactile corpuscles, 16
thickness of the, 4
trophoneuroses of the, 750, 832
tumors of the, benign, 631
ulcerative affections of the, 475
nervous, 843
Vater's corpuscles, 16
vegetable parasites of the, 64
Skin-disease, epidemic, 257, 284
Small-pox, prevention of scarring in, 646
Spider-bites, 41
Spider cancer, 672, 674
Spinal cord, dermatoneuroses secondary to lesions of the, 809, 853
Spotted sickness (pinta disease of the skin), 116
Squamous Affections of the Skin, 265
psoriasis, 265; pityriasis rubra, 280; pityriasis rosea, 290
Startin's mixture, 155, 507
Stearrhœa nigricans, 544
Steatozoön folliculorum, 54
Stigmatism, 811
Stratum corneum of the epidermis, 5
granulosum of the epidermis, 6
lucidum of the epidermis, 6
mucosum of the epidermis, 6
Strophulus, 559
albidus of Willan, 501
simplex intertinctus (of the older writers), 338
Sudamen, 560
Summer eruption, recurrent, 386
Sunburn, 244
Sweat, bloody, 552, 813
disorders of the secretion of, in disease, 557

Sweat Glands, Diseases of the, 525
functional affections, 525; hyperidrosis, 525; bromidrosis, 536; chromidrosis, 539; uridrosis, 550; phosphoridrosis, 551; hæmatidrosis, 552; anidrosis, 557; *structural affections,* 559; miliaria, 559; hydrocystoma, 560; hidrosadenitis, 563; bibliographical references, 569
Sweating sickness, 560
Sycosis, 88, 438
coccogenic, 438
hyphogenic, 88
keloidal, of the nucha, 521
lupoid, 442
non-parasitic, 438
diagnosis of, 445
diagnosis of, from acne, 448
diagnosis of, from eczema, 189, 218, 445
diagnosis of, from lupus erythematosus, 447
diagnosis of, from lupus vulgaris, 447
diagnosis of, from parasitic sycosis, 90, 446
diagnosis of, from syphilis, 447
etiology, 443
pathology, 444
prognosis, 448
symptoms, 439
treatment, 448
variations, 442
parasitic, 88
diagnosis of, 90
diagnosis of, from eczema, 190, 218
diagnosis of, from non-parasitic sycosis, 90, 446
etiology, 89
pathology, 90
prognosis, 92
treatment, 91
Syncope, local, of the extremities, 800
Syringocystadenoma, 718
Syringomyelia, the nails in, 624
Syphilis, affections of the nails in, 624
alopecia in, 586
Syphilis cutanea papillomaformis (vegetans), 369
diagnosis of, from alopecia areata, 594
from ecthyma, 436
from eczema, 190
from erythema intertrigo, 133
from erythema induratum, 161
from erythema multiforme, 154
from erythema nodosum, 159
from hydroa, 388
from impetigo herpetiformis, 432
from lichen ruber, 316, 318
from lichen scrofulosorum, 360
from lupus erythematosus, 703
from pemphigus, 381
from pityriasis rosea, 293
from psoriasis, 272
from rhinoscleroma, 717
from ringworm, 69, 80
from sycosis, 447
from tinea versicolor, 101

Tabanidæ, 41
Tabanus bovinus, 41
Taches méningitiques, 787
Tænia echinococcus, hydatid of the, 59
solium, hydatid of the, 58
Telangiectasis, 674
Telangiectatic warts, 688
Tetter, wet, 169
Thermo-anæsthesia, 776
Thrush, 116
Tick, 39
Tinea circinata, 67
decalvans, 120
favosa, 102
diagnosis, 108, 191
etiology, 105
of the epidermis, 104
of the nails, 105
of the scalp, 102
pathology, 105
prognosis, 111
synonyms, 102
treatment, 108
imbricata, 96
kerion, 75
sycosis, 88
tarsi, 210

Tinea tonsurans, 78
bald, 75
Tinea trichophytina, 66
etiology, 76, 89, 93
pathology, 68, 71, 77, 90, 93
prognosis, 70, 72, 87, 92, 95
synonyms, 66, 67, 70, 78, 88, 92
treatment, 70, 72, 81, 91, 95
barbæ, 88
diagnosis, 90, 446
etiology, 89
prognosis, 92
treatment, 91
capitis, 73
chronic or disseminated, 75
diagnosis, 79, 594
etiology, 76
pathology, 77
prognosis, 87
treatment, 81
corporis, 67
diagnosis, 69, 101, 190, 154, 272, 292, 708
pathology, 68
prognosis, 70
treatment, 70
cruris, 70, 113, 133, 181, 227
pathology, 71
prognosis, 72
treatment, 72
unguium, 92
diagnosis, 94
etiology, 93
pathology, 93
prognosis, 95
treatment, 95
Tinea versicolor, 97
diagnosis, 100, 112, 191
etiology, 99
pathology, 99
prognosis, 101
synonyms, 97
treatment, 101
Tongue, pruritus of the, 774
Torula utero-catarrhalis, 115
Trichauxis, 577
Trichoclasis, 610
Trichoma, 614
Trichomania, 582
Trichomycosis nodosa, 602
Trichonosis versicolor, 600
Trichophyton, 66
megalosporon, 78
pyogena, 90
microsporon, 78
Trichophytosis, 66
Trichoptilosis (of Devergie), 610
Trichorrhexis nodosa, 610
diagnosis of, from monilethrix, 612
from piedra, 604, 612
Trichotillomania, 582
Trombidium holosericeum, larva of the, 51
Trophoneuroses, cutaneous, 750, 832
Tuberculin, rash caused by, 248
Tuberculosis preceded by pruritus, 769
Tumors of the skin, 631
painful subcutaneous, 661
Tunica dartos, 15

Ulcers, factitious, 253
perforating, 843
tropical phagedenic, 475
Ulerythema centrifugum, 691
ophryogenes, 588
sycosiforme, 442
Umbilicus, eczema of the, 227
Unguis incarnatus, 618
Uridrosis, 550
Urticaria, 816
diagnosis of, from bedbug bites, 38
from dermatitis herpetiformis, 401
from eczema, 191
from erythema multiforme, 154
from impetigo contagiosa, 424
from pemphigus, 381
from prurigo, 332
epidemic, from caterpillar stings, 42
giant, 820, 827
œdematous, 820, 827
tuberous, 820, 827

Vagabond's disease, 34
Vaginomycosis, 115
Van Harlingen, Arthur, on Diseases of the Sebaceous Glands, 479
on Diseases of the Sweat Glands, 523
Varicella, diagnosis of, from impetigo contagiosa, 424
from pemphigus, 381
gangrænosa, 466

Varicose veins, eczema associated with, 219
Vater's corpuscles, 16
Veins, varicose, eczema complicating, 219
Verruca, 632
acquisita, 634
acuminata, 635
caduca, 634
congenita, 634
diagnosis of, from lymphangioma circumscriptum, 690
from molluscum contagiosum, 718
digitata, 634
etiology, 635
filiformis, 634
plana, 633
seborrhœica, 486
perstans, 634
senilis, 633
treatment, 637
vulgaris, 632
Vespidæ, 41
Vitiligo, 848
diagnosis of, from tinea versicolor, 100
Vitiligoidea, 662

Warts, 632, see *Verruca*
soft, 658
telangiectatic, 633
venereal, 635
Wasp-stings, 41
Whitehouse, Henry H., on Bullous Affections of the Skin, 363
on Erythematous Affections of the Skin, 125
Whitehouse, Henry H., on Pustular Affections of the Skin, 411
Wilkinson salve, 203
Winged nail, 620
Winter itch, 771
treatment, 876
Wood tick, 39
Wounds, healing of, 640

Xanthelasma, 662
Xanthodermia, 665
Xanthoma, 662
anatomy, 665
diabeticorum, 666
diagnosis, 666
en tumeurs, 664
planum, 663
prognosis, 666
treatment, 666
tuberculatum or tuberosum, 663
Xeroderma Pigmentosum, 727
history, 727; development and course, 729; symptoms, 729; pathology, 732; anatomy, 733; etiology, 739; diagnosis, 739; prognosis, 740; treatment, 741; bibliographical references, 741
anatomy, 733
bibliographical references, 741

Yaws, diagnosis of, from furunculus orientalis, 463

Zeiss' glands, 12
Zimb, 63
Zona, 836
Zoster, 836
atypicus gangrænosus et hystericus, 472

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